New Subsidiary Set Up to Provide Services Overseas

General Dynamics formed a wholly owned subsidiary to provide technical and operational support services on a worldwide basis.

The president of the new subsidiary, incorporated as General Dynamics Services Co. (GDSC), will be Dorhman E. Veirs, 56, formerly Vice President of International Operations for the Lockheed Aircraft Services Company.

David S. Lewis, Chairman and Chief Executive Officer of General Dynamics, said, "The new subsidiary will provide support services for products produced by General Dynamics divisions and subsidiaries, and also provide field engineering, test and site management, training, repair, maintenance and other services required in countries around the world.

"Our growing international business in military aircraft, tactical missile systems, telecommunications and electronics and marine systems was a major factor in establishing the services company," he said.

"The new subsidiary will be able to call upon the experience and technical capabilities of personnel throughout General Dynamics in carrying out its programs," Lewis said.

The new company has recently completed one of several competitive contract definition phase studies for a major project relating to the naval expansion program of the Kingdom of Saudi Arabia (see related story). The company has teamed with Ballast Nedam Groep, a Netherland company, Mansour Corp., an Arabian firm, and with Avco Corp. on this effort. If GDSC wins the contract, it will provide operation, training and maintenance services at Saudi Arabian naval facilities at Jidda, Jubail and Damman. The company would establish an office at Riyadh, Saudi Arabia to manage this program.

Dorhman E. Veirs

Mr. Veirs has had extensive experience in the maintenance and support field, both in the U.S. and overseas. During his 24 years with Lockheed Aircraft Services Co. (LASC), he held a number of engineering and management positions, including the responsibility for establishing an operational maintenance base in Saudi Arabia; Managing Director of Singapore Operations; and Manager of the Ontario, Calif., maintenance base. He had been appointed to his most recent position at LASC, Vice President of International Operations, in 1977.

He is a graduate of the University of California with a Bachelor of Science degree in mechanical engineering. He served as an Air Force pilot in World War II and the Korean conflict.

GDSC May Need to Recruit 500 Employes in a Hurry

An aggressive and challenging recruiting effort is being planned by General Dynamics Services Co. (GDSC).

Last year, GDSC submitted a proposal to the U.S. Navy which calls for operational, training and maintenance at two new Naval bases supporting fleets of ships of the Royal Saudi Navy. If successful in winning the contract, GDSC will be required to recruit more than 500 persons over a six month period to fill management, technical and administrative positions in both Saudi Arabia and the United States.

Hub of the Royal Saudi Navy Program activity has centered at Convair in San Diego which has been host division for the proposal effort. The group is competing with two other consortiums for the Saudi contract, which is expected to be awarded in February.

Warren Sullivan, Corporate Vice President - Industrial Relations, said "The main thrust of our recruiting effort will be toward obtaining the

(Continued on Page 4)

GD World

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Operational Air Force Unit Receives 1st F-16 Fighter

The first operational F-16 was delivered to the 388th Tactical Fighter Wing at Hill AFB, Utah, on Jan. 6th.

The delivery marks the end of the development phase of the U.S. Air Force's latest fighter aircraft program.

Following the formal acceptance of the single seat fighter at Hill, Air Force Col. James G. Rider, Assistant Deputy Commander for Operations of the 388th, demonstrated the F-16's extraordinary climb rate, turning agility and maneuverability in a two-seat F-16B.

Until recently, Col. Rider commanded the Air Force/General Dynamics F-16 Joint Test Force at Edwards AFB, Calif., after the F-16 was selected by the Air Force as its new multirole fighter.

The 388th is responsible for training the first American and foreign F-16 pilots, and the Ogden Air Logistics Center at Hill will have world wide responsibility for supporting the F-16 in service.

The 388th was activated in 1942 and flew Boeing B-17 Flying Fortresses during World War II – a bomber which carried only two thirds the ordnance load of an F-16 even though it weighed twice as much.

The F-16 was selected by the Air Force as its Air Combat Fighter on January 13, 1975, and, in June 1975, Belgium, Denmark, the Netherlands and Norway also selected the F-16.

Maiden Flight. *An F-16B, scheduled for delivery to the Belgium Air Force later this month, completed a successful first flight over southern Belgium in December. The aircraft is the first of 348 F-16s to be delivered to the air forces of Belgium, Denmark, the Netherlands and Norway.*

European-Assembled F-16B Makes 1st Flight in Belgium

Last month, the first F-16 Multirole Fighter scheduled for delivery to a European air force successfully completed its first flight in Gosselies, Belgium.

The two-seat fighter-trainer, an F-16B, was flown by Belgian test pilot Serge Martin of SABCA with General Dynamics Chief Test Pilot Neil R. Anderson in the rear seat during the 70-minute flight over southern Belgium.

The aircraft is the first of 348 F-16s scheduled for delivery to the air forces of Belgium, Denmark, the Netherlands and Norway. After completing a series of acceptance flights, the new fighter is scheduled to be delivered to the Belgian Air Force in late January.

Jointly produced by U.S. and European industry, the F-16B underwent final assembly in the SABCA and SONACA facilities at the Charleroi-Gosselies airport. SABCA and SONACA will produce aircraft for the Belgian and Danish air forces. A second European F-16 assembly line, operated by Fokker-VFW near Amsterdam in the Netherlands, will produce aircraft for the Dutch and Norwegian air forces.

The F-16s scheduled for the U.S. Air Force are being assembled at Fort Worth Division. The governments of the U.S. and its allies are planning to buy nearly 2,000 F-16s.

GD Board Votes to Split Stock, Resume Regular Cash Dividends

The General Dynamics Board of Directors decided on Jan. 4, 1979 to resume regular quarterly dividends on the company's common stock, on which no dividends have been paid since 1970. The Board also voted a split of the common shares in a ratio of two and one-half for one.

David S. Lewis, GD Chairman and Chief Executive Officer, said that on Feb. 19, 1979, the company will transmit to each shareholder one and one-half shares of common stock for each share held by a shareholder on Jan. 19, 1979, the date of record. Also on Feb. 19th, the company will pay a cash dividend of 75 cents per share on the presently outstanding shares, which will be the equivalent of 30 cents per share after the two and one-half for one split.

Mr. Lewis announced that the Board had also voted the first dividend of 89.6 cents per share on the company's Series A preferred stock to be payable on Feb. 15, 1979 to the preferred stock shareholders of record on Jan. 19, 1979. The dividend will cover the period beginning Dec. 1, 1978, the date the acquisition of American Telecommunications Corp. by General Dynamics became effective.

Lewis said that based on the company's estimate of earnings and profits through the year 1979, counsel for the company have advised that in their opinion, these dividends to shareholders of both the common and preferred stock and any other dividends paid in 1979, and for some period thereafter, should not be taxable as ordinary income for federal income tax purposes. The dividends will represent a return of capital and will reduce the tax basis of the shareholders' stock, he said.

Lewis said that the company's determination of this tax situation is subject to review by the Internal Revenue Service and to audits of the tax returns of the company and the shareholders receiving the dividend payments. Shareholders will be advised by the company as to developments in the tax status of dividends paid, he said.

Deductions for Social Security Jump Sharply

The Federal Insurance Contribution Act (FICA) deduction rate for Social Security will increase again in 1979. The new 1979 rate will be 6.13 percent of earnings of $22,900 or less. The maximum tax paid by an employe on that amount, $1403.77, will be matched dollar for dollar by General Dynamics as its FICA contribution.

No increase in tax rate is set for 1980. However, the earnings range will increase to $25,900 and the maximum tax withheld will be $1588.

The 1979 rate of 6.13 percent compares to a 1978 rate of 6.05 percent and 1977 and 1976 rates of 5.85 percent. Earnings range for 1978 was $17,700, with a maximum tax of $1,070.85.

Fort Worth Wins Contract To Demonstrate Advanced Technologies for Aircraft

The U.S. Air Force has awarded a $34.3 million contract to Fort Worth Division for the development and flight demonstration of advanced fighter aircraft technologies using an F-16 as a test vehicle.

The Advanced Fighter Technology Integration (AFTI) program is being managed by the Air Force Flight Dynamics Laboratory (AFFDL) and is sponsored by the Air Force, the U.S. Navy and the National Aeronautics and Space Administration (NASA).

In the program, an F-16 test aircraft will be used to demonstrate aerodynamic and control technologies.

The AFTI program is expected to develop a significant improvement in air-to-air and air-to-ground combat effectiveness. A dramatic improvement in air-to-surface attack survivability is expected to be shown because of expanded maneuvering capabilities.

The AFTI-F-16 Program Manager at Fort Worth is Max Waddoups.

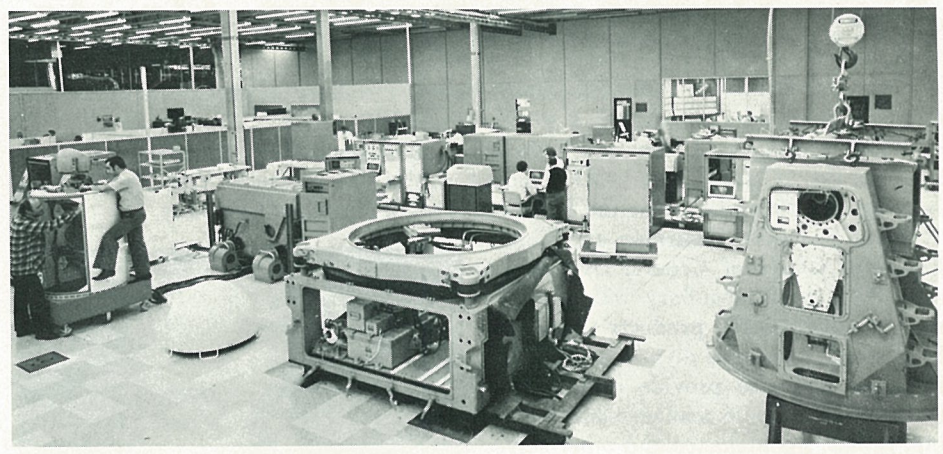
According to U.S. Air Force Lt. Col. Frank Moore, the AFTI-F-16 program will be managed as a two-phase effort. In Phase I, the digital flight control technology together with advanced aerodynamic technology will be developed and ground tested over several months at Fort Worth. Flight testing for Phase I is scheduled to begin in June 1981 from the Air Force Flight Test Center and NASA's Dryden Flight Research Center at Edwards AFB, Calif.

Following Phase I, the AFTI-F-16 will be modified for Phase II which will be an integrated flight/fire control technology demonstration. The modifications will include electro/optical and radar target sensor tracking systems, flight and fire control system couplers and pilot controls and displays.

The AFTI-F-16 will be capable of flying maneuvering weapons delivery profiles demonstrating improved effectiveness and survivability. These profiles include attack descents in banking type maneuvers during weapons delivery.

In the air-to-air mode, the AFTI technologies will allow faster and more accurate alignment on the target over a wide range of attacks.

In an earlier related contract, the Control Configured Vehicle program, Fort Worth modified a YF-16 under a $6 million contract administered by AFFDL to demonstrate, among other things, how an aircraft with two canards, or fins, mounted under its fuselage could point its nose up or down or left or right without changing its direction of flight.



Phalanx Under Way. *Manufacture of initial production units of the Phalanx radar controlled gun system is under way at Pomona where the first units are taking shape on the production floor. The first production Phalanx unit will be delivered to the U.S. Navy in 1979. The initial production contract is for 37 units for close-in ship defense, primarily against the threat from sea-skimming missiles.*

Viper Aims and Fires. *Pomona is gearing up to produce the lightweight, portable shoulder-fired Viper anti-tank system. Above, a soldier aims from the brush.*

Camden Facility Gears Up For Production of Viper

Pomona Division is gearing up for the largest quantity production program in its history using the General Dynamics Camden, Ark., facility. In conjunction with three major subcontractors, Pomona will deliver Viper weapons by the thousands.

Designed and developed by General Dynamics for the U.S. Army, Viper has greater effectiveness and better accuracy than any other light, antiarmor weapon.

"Viper makes every soldier a significant threat to enemy armor, because it can be issued as a round of ammunition for employment by all combat soldiers," according to Ray Gill, Viper Program Director. "Because of Viper's effectiveness, the Army is very anxious to get it into the field as soon as possible."

Pomona was awarded an initial production facilities contract in September to set up and proof the assembly line in preparation for the production contract award expected in October this year.

"We plan to deliver several thousand tactical units and trainers the first year," says Bill Drum, Production Manager.

These high production rates will be accomplished through close cooperation between Pomona and its major subcontractors: Atlantic Research Corp., which will load propellants for the rocket motors at the Camden facility; Brunswick Corp., which will fabricate launch tubes and rocket motor cases in Lincoln, Neb., and Bulova Watch Co., Inc., which will make the warhead fuze in New York. The Iowa Army Ammunition Plant will assemble the weapons in Iowa.

"As is true with other Pomona programs, we feel that while Viper meets today's needs, it will continue to evolve to meet developing threats and offer antiarmor capability to our armed forces well into the 1980s," says Jeff Smith, Viper Marketing Representative.

Savings and Stock Investment Values

The GD Savings and Stock Investment Plan unit values at the end of November 1978 were as follows:

Salaried	
Government Bonds	$2.0607
Diversified Portfolio	1.2643
Hourly	
Government Bonds	2.0598
Diversified Portfolio	1.2928
General Dynamics Stock	$ 74.75

Convair's Tomahawk Begins New Phase of Survivability Testing

The second phase of the cruise missile survivability test program began Dec. 13th when a Convair-built Tomahawk cruise missile completed an air-launched flight over the White Sands Missile Range in New Mexico.

According to Dr. William J. Perry, Under Secretary of Defense for Research and Engineering, the second phase of the survivability test program is designed to obtain additional specific information on the capabilities of advanced defensive systems. During the test program, live firings against Tomahawks will be conducted to test defensive missile fuzing systems.

"Our live firings will be designed in such a way that we will be able to shoot down a cruise missile, that is, we will conduct the tests in such a way that we have a series of passes that get closer and closer until we finally get one that is successful," Dr. Perry said in a news briefing in November.

Perry said the tests were designed to discover in what range and under what conditions a cruise missile can be shot down by enemy defense systems.

In the November press briefing, Perry said the first phase of the survivability test program had determined "that the Soviet air defense system is totally ineffective against" cruise missiles.

He said the cruise missile represented a challenge to the Soviet air defense system that a simple fix would not correct.

"Just to put that into perspective, (consider) the magnitude of the problem that we are confronting them with: they have more than 10,000 (air defense) radars deployed; they have more than 1,000 SAM (surface to air missile) systems deployed, they have more than 1,000 interceptors deployed, but that entire system is rendered useless."

Perry believes present cruise missiles could be countered by a combination of an airborne warning and control system coupled with new interceptors with a look-down shoot-down capability and a terminal SAM defense system.

However, such a move could cost as much as $30 billion to be effective — and could be countered in future generations of cruise missiles by penetration aids and other innovations, he said.

At the present time, Convair is working on a $114 million contract for competitive development of the U.S. Air Force's air launched cruise missile in a program which involves a flyoff between Convair's Air Launched Cruise Missile (AGM-109) and Boeing's missile (AGM-86).

During the news briefing, Perry said research and development of the Tomahawk submarine launched cruise missile was being pursued "very vigorously" but that no procurement decision had been made so far.

'Kilroy Was Here' — at Quincy

Before the Second World War, nobody had ever heard of Kilroy. But suddenly across the world, signs sprang up in the most unlikely places proclaiming "Kilroy Was Here."

"Kilroy" graffiti followed American forces across the Atlantic and Pacific to New Zealand and Australia, to North Africa, Sicily, and England and onto the Continent of Europe. He has left his mark from New York subways to African jungles.

"I saw 'Kilroy Was Here' written in a restaurant in the Middle East three and a half years ago," says Jack Flaherty, Acting Manager of Steel Trades at Quincy. "If that man had traveled to all the places where that phrase has been written, he would have had to live for seven thousand years.

"Actually, I knew James Kilroy, The Kilroy," Flaherty says. "He was a rate setter at the Fore River Shipyard during the 1940s. Kilroy would mark the rivets a crew had placed during a shift with a piece of chalk. Each crew would be paid for the amount of work it did, and it could be paid more if the rate set for the shift was exceeded."

Kilroy joined the Fore River Shipyard of Bethlehem Steel Co. in 1941, a few days before the attack on Pearl Harbor. After war was declared, the shipyard, now Quincy Shipbuilding Division, began turning out vessels for the war effort.

One day, Kilroy was accused of not checking a job and the next day, after he crawled out of a manhole of a tank he had just checked, he scribbled "Kilroy was here" to make certain everyone knew it had been checked.

Soon he was writing his message over the interiors of ships that were rapidly being turned out at the yard. Because of the wartime rush, many of the decks and bulkheads of the ships he was inspecting remained unpainted after his message had been scrawled on them and his slogan was later spotted by sailors and soldiers who adopted it as their own.

The identity of Kilroy might have remained a secret but for a contest sponsored by the American Transit Association in 1947 to determine who Kilroy was. Kilroy wrote to the judges and won the grand prize — a trolley car. Kilroy left the shipyard after the war, and after a career in politics, died in 1962.

"I think Kilroy got a big kick out of winning that trolley," Flaherty says, "but he thought it was funnier that his name went around the world."

J. Ashton Named VP at Fort Worth

James E. Ashton has been named Vice President of Production at Fort Worth Division. Mr. Ashton formerly served as Manufacturing Management Support Director.

A native of Davenport, Iowa, Ashton attended the University of Iowa, where he received a bachelor's degree in civil engineering. He also attended the Massachusetts Institute of Technology, graduating with a master's degree in materials engineering and with a doctorate in structural mechanics. Most recently, he received a Master of Business Administration degree from Harvard University.

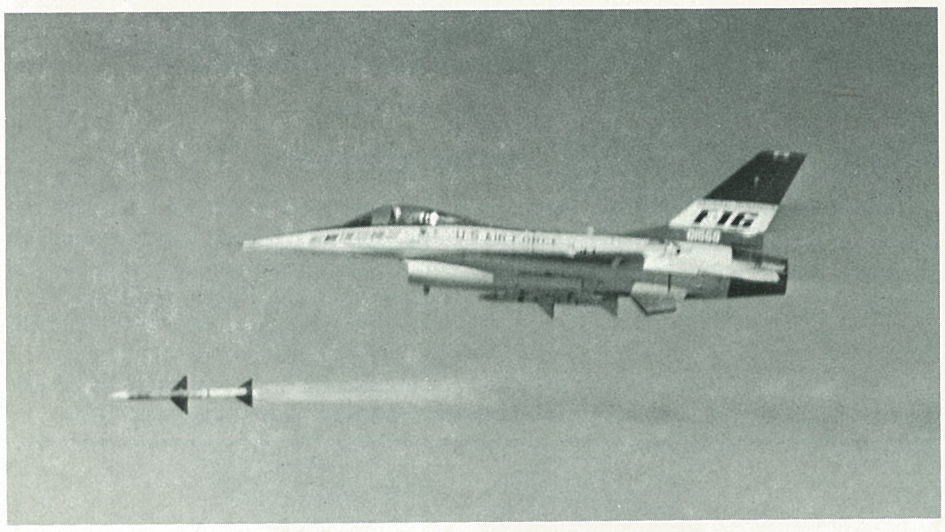
Ashton has held a variety of positions at Electric Boat, Convair and Fort Worth divisions over an 11-year career with GD.

YF-16 Launches Sky Flash Missile

A British Sky Flash medium range air-to-air missile was launched successfully from a prototype General Dynamics YF-16 fighter aircraft during tests at Pt. Mugu, Calif., recently.

The YF-16 was flying at a speed of Mach 1.3 at an altitude of 28,000 feet when the missile was fired by GD Test Pilot David Palmer.

Sky Flash, produced by British Aerospace Corp., is a semiactive radar homing missile with a monopulse seeker. It is being fitted to Royal Air Force Phantom and Tornado aircraft and has been selected by Sweden for integration with the Viggen fighter. It is also being considered by a number of other air forces, including potential users of the F-16. The U.S. Air Force currently has no plans to utilize Sky Flash on its F-16s.



Successful Launch. *Sky Flash, a British medium range air-to-air radar-guided missile, was launched successfully from a YF-16 prototype recently. The Sky Flash is one of the most advanced weapons of its type currently in production.*

At Edwards. *The first production F-16 fighter-trainer (F-16B) has begun service with the U.S. Air Force at Edwards AFB, Calif. The U.S. Air Force plans to procure 204 F-16Bs.*

Service Awards

40 Years

Research and Engineering: C. Kerr Jr.

35 Years

Operations: R. B. Wilson.

Finance: C. S. Spoden.

Research and Engineering: H. Weimer.

Quality Assurance: L. H. Cooke, E. W. Wright.

30 Years

Operations: D. C. Constantino, O. R. Sorensen, A. Rohr, J. F. Pearl.

Research and Engineering: O. Wade.

25 Years

Research and Engineering: G. L. Drake Jr., R. W. Casebolt, R. R. Lanflisi, C. C. Dickinson, G. E. Sawyer.

Quality Assurance: R. V. Shields.

Finance: J. B. Roisman.

Operations: F. D. Holbrook, G. L. Criger, L. P. Smith, J. B. Franklin, C. J. Popp, E. R. Sperl, J. L. Baker, J. A. Fielder, J. E. Mullins, E. L. Sisler.

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Jack Isabel — Contributing editor, Convair Edition

Paul Suprenant

Sign Painter's Handiwork Important to EB Operations

By Jim Reyburn

Some people may have the world for an oyster, but Paul Suprenant is content with having Electric Boat Division as a gallery. His art work hangs everywhere — in offices, hallways, laboratories, alongside building ways and on the subs.

Mr. Suprenant is a sign painter, and while many of his creations don't necessarily strike an aesthetic note, they definitely communicate. "Watch Inner Door," "Defense Plant — No Photographing Allowed," "Walk to the Right" and other signs all offer something the viewer needs to know to act and navigate properly through the inner reaches of the nation's leading submarine shipyard.

Other Suprenant works require nothing more than passive appreciation, like the bow launching bunting he designed for four submarines — *Glenard P. Lipscomb* and the 688-class subs *Philadelphia, New York City* and *Indianapolis.*

He enjoys the creativity involved in the bow piece work. First, armed with an idea, he does a rough sketch. Next comes a small finished sketch, then a sketch on pieced canvas stretched over a full-sized mock-up of the bow. The final painting is in oils.

Instead of signing his name to a bow piece, Suprenant, a proud father, dedicates it to one of his four children — Tammy, Debbie, Chris and Robin. "Very few people know about that," he chuckles through his finely manicured handlebar moustache. "I always make the name very small and put it in a very inconspicuous place."

Understandably, creating bow pieces is a sometime thing. Most art works that Suprenant and his colleague, Steve Crouch, a five-year veteran, turn out, are signs, pure and simple. Their average output is 10 signs a week, with a maximum of 20 a day when they're doing station signs — one letter and one number designating certain locations. Small signs can take as little as a half hour to complete, and large ones, more than two days. Most are hand-lettered, but for some volume jobs, they cut stencils by hand and set up a form of production line.

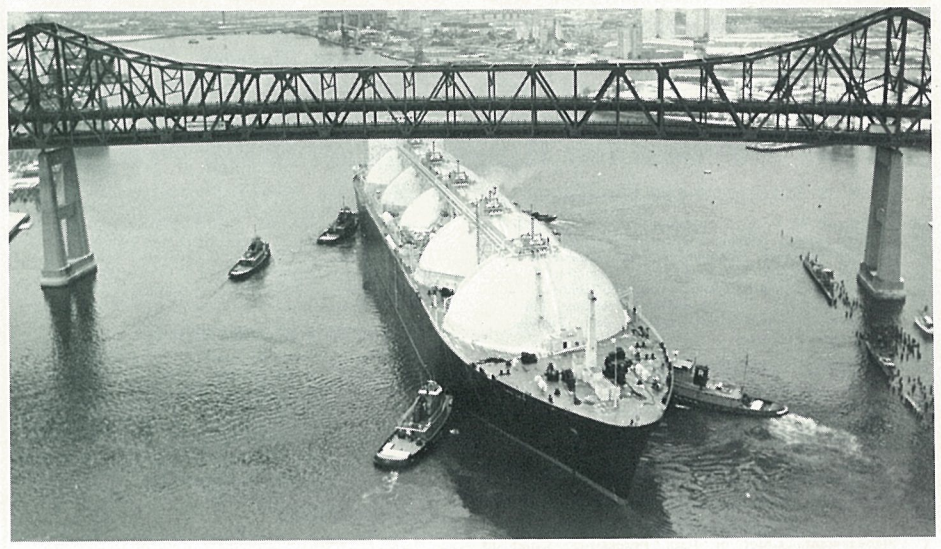
One of the largest signs Suprenant has painted, on a four-by-eight sheet of plywood, ended up playing an entirely different role than originally intended. Pressed by someone who needed it in a hurry, he finished the sign in record time.

"I don't know whether it was ever used as a sign," he laughs. "Two days later I saw a maintenance crew ready to pour a concrete stairway outside a building. Something caught my eye. Sure enough, there was the sign, cut accordingly, being used as the right-hand form for the stairway."

Such blows to his ego don't really bother Suprenant, who traces his love for art back to his grammar school years in Plainfield, Conn., where he lives with his family in his boyhood home. "I was good in art and lousy in math," he relates. "And by the seventh grade, I felt that getting into some form of art would be enjoyable."

He finally eased behind the drawing table seven years ago after stints at Electric Boat for several years as a test technician and maintenance crane mechanic.

"I learned something on those jobs, but I prefer what I'm doing now," he confides. "It's perhaps the closest thing to real art work. There's good money in it. And what I do helps a lot of people every day. What more can you ask from a job?"



Quincy Giant. LNG Leo, *the fifth liquefied natural gas (LNG) tanker built by Quincy Shipbuilding Division, is assisted by tugs at Everett, Mass., at the New England LNG Terminal prior to gas trials. The 936-foot, 95,000-ton tanker will join four sister ships now transporting LNG from Indonesia to Japan.*

New Criteria Said to be Affecting Design of New Military Aircraft

New criteria are affecting the design of military aircraft in an era that is limited by cost rather than technology, David S. Lewis said in a recent speech.

Speaking before the Royal Aeronautical Society in London in December, GD's Chairman and Chief Executive Officer said that the cost limitation marks a third major era in the development of military aircraft and has meant that cost analysis of requirements and design have become extremely important.

In this cost-limited era of aircraft design, individual aircraft are so expensive to develop that the number of new aircraft program starts has declined dramatically in all the major nations of the Free World, he said. Nations have been trying to solve this by collaborating in production and development programs and, as a result, individual programs have become larger and more expensive.

In cases of multinational aircraft development, Lewis stressed the need for program coordination under a single director with authority to make clear-cut decisions regardless of the possible impact on the industries of each of the several nations involved.

Lewis, who delivered the 67th Wilbur and Orville Wright Memorial lecture before the Society, said that the first era in the development of military aircraft followed the Wright brothers' flights.

"The early years, which lasted perhaps three decades, were marked by limited knowledge and limited growth in technology," he said.

The middle years or second stage lasted about 20 years and were noted for accelerated technological advancement.

This third stage, the period since the mid-1950s until the present, has brought many problems to the military aerospace industry. Available technology has become so varied, complex and expensive that many nations find it difficult to select which course to take and even how to afford the option they would choose as the best possible one to defend themselves.

"These very large resources involved in building an aircraft have naturally led to a much greater political interest in each new program start," Lewis said. "Thousands of jobs are at stake in each decision and, increasingly, such issues as national balances of trade and national prestige are beginning to be the dominant forces in making decisions which were formerly based on only technical or operational considerations.

"In the Free World today, there are fewer aircraft design teams and highly qualified production operations than there were two decades ago. Even with these reduced numbers, however, there are still more than can be supported on an economical basis by current and forecast military and commercial aircraft programs.

"Despite this, each country is more or less determined to keep its design teams and production facilities operating almost at any cost. There is, of course, no easy solution to the short-term political problems. . . in a given national area if the traditional aircraft industries were closed. But perhaps even more serious defense problems can result from a policy of multinational development and production programs," he said.

Lewis said funds and resources available for military expenditures have become more and more limited and planners must always weigh needs against cost.

"After determining what level of weapon system performance can be delivered by current levels of technology, (military planners) must obtain the best possible understanding of a potential enemy's capabilities, and then they must exercise the greatest conceivable self-discipline and maturity of judgment to ask only for what will be necessary," Lewis said.

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GDSC May Need 500 Specialists

(Continued from Page 1)

skills from within General Dynamics to fill the management staffing needs that will open at GDSC."

He pointed out that the Royal Saudi program, if awarded to GDSC, offers opportunities to those selected to broaden themselves while improving their capability in their specialties.

"This is a chance for General Dynamics' divisions to meld all their strengths together," said Jim Burns, Vice President and Royal Saudi Program Director.

The Saudi contract will require about 150 persons for program management in the U.S. The manning requirements in that area include those experienced in financial operations and planning; administrative services; subcontract management; training management, and self-support management. Mr. Sullivan said some of those on the program management team would transfer to Saudi Arabia.

The bulk of the people – about 400 – are needed for planning and preparation assignments. These assignments include ship maintenance and repair, ship systems support, supply, technical training, etc. After training in the U.S. most of those in the planning group will relocate to Saudi Arabia.

"If you are qualified," Sullivan said, "and are interested in these challenging opportunities, all you need do is contact your employment office and submit a resume to the program office in San Diego. We'll review your experience, and, if you are selected as a candidate, get in touch with you for further discussion."

The resume should be addressed to Royal Saudi Navy Program, Lindbergh Field, General Dynamics, Attn: Employment Manager, MZ 74-1004, PO Box 80877, San Diego, Calif. 92138.

Skills Needed for Royal Saudi Navy Program

Key Management Positions

Director of Data Management, Controller, Manager of Estimating, Manager of Planning, Ship Repair Facility General Manager, Supply Center General Manager, Supply Depot General Manager, Director of Education, Ship Systems Support Center General Manager, Crew Familiarization Training Manager, Manager of On-The-Job Training and Director of Manpower Resources.

Ship Systems Support

Electrical Engineer, Electronics Engineer, Equipment Specialist, Mechanical Engineer, Organization Planner, Planning Yard Manager, Production Planning Manager, Publications Supervisor, Ship Repair Facility Planning Manager, Technical Information Specialist and Technical Writer.

Data Management/Processing

Associate Programmer, Chief of Contract Data Management, Chief of Data Processing, Chief of Libary Sciences, Chief of Management Systems, Chief of Technical Data, Computer Programmer, Data Systems Specialist, Director of Data Management, Programmer Analyst/Sr. and Technical Information Specialist.

Supply and Logistics

Cargo Scheduler, Chief Storekeeper, Logistic Management Specialist, Manager—Material Control, Manager—Purchasing, Manager—Records Division, Manager—Supply Support, Manager—Supply, Manager—Transportation, Material Control Planner, Material Purchasing Planner, Storage Specialist, Supervisor—Handling Equipment Specialist, Program Analyst/Sr., Supply Catalog, Supply Manual Writer, Supply Program Analyst, Supply System Manual Supervisor, Technical Writer/Editor and Transportation Specialist.

Business Management

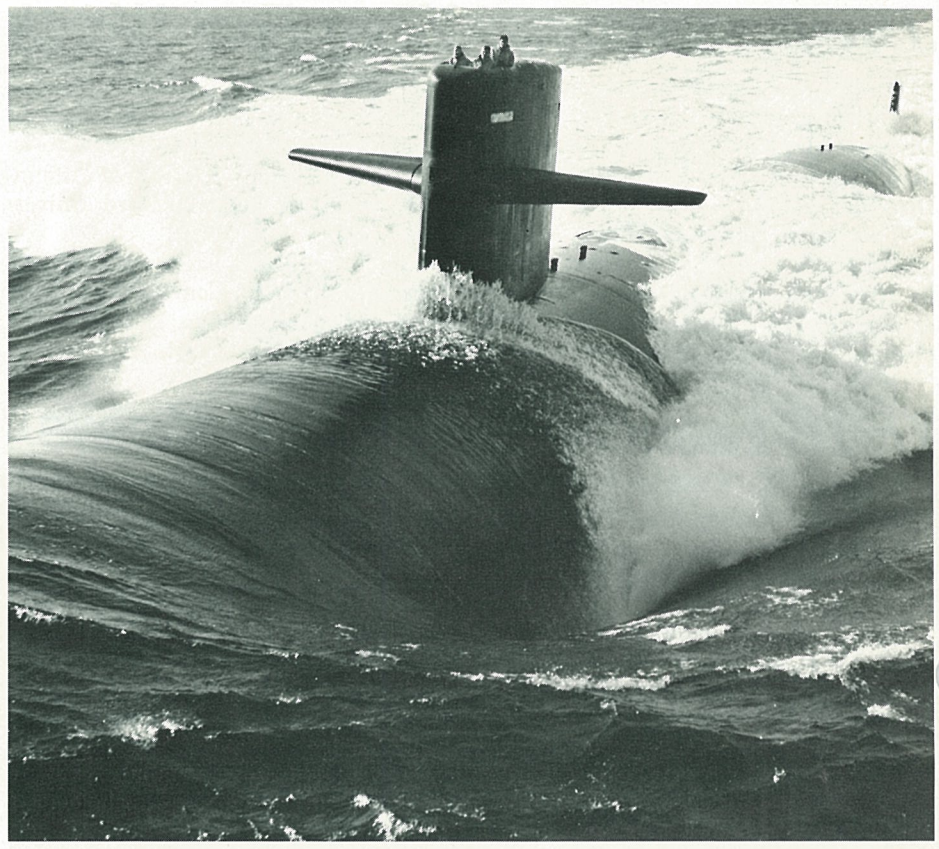
Accountant, Accounting Analyst/Sr., Chief of Contracts, Chief of Estimating, Chief of Finance, Estimator, Estimator/Sr., Estimating Manager, Estimating Specialist, Financial Analyst/Sr., Forecast Analyst/Sr., Management Planning Analyst, Program Control Analyst, Program Analyst, Purchasing Agent/Sr. and Subcontract Administrator.

Personnel/Manpower Resources

Co-op Program Coordinator, Personnel Manager, Personnel Staffing Specialist, Wage and Salary Analyst and Manpower Planner.

Training Job

Curriculum Development Specialist, Education Specialist, Instructors for USN A and C Schools, OJT Course Developer, OJT Course Writer, Training Specialist and Instructors for Crew Familiarization Training.



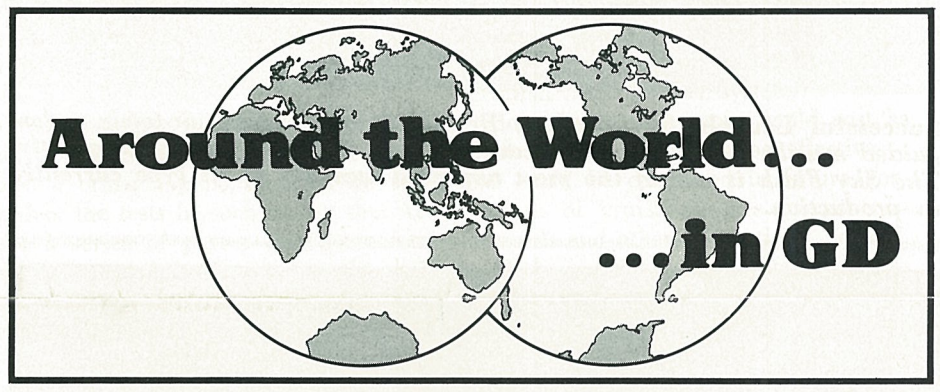
New York City on Trials

New York City Completes Trials

New York City (SSN696), Electric Boat's fourth 688-class submarine, has completed its initial sea trials steaming at full power both surfaced and submerged.

Aboard for the trials were Admiral Hyman G. Rickover, representing the U.S. Department of Energy and the U.S. Navy, and 34 EB employes including L. Emmett Holt, Assistant General Manager – Operations and Robert Rathbone, Nuclear Test Manager, who was the EB trial crew chief.

The submarine is scheduled to be delivered to the Navy this year.



At CHQ: *Clinton C. Beyers* was promoted to Corporate Manager of Pricing . . . *Jeffry B. Smith* transferred from Pomona as Corporate Huntsville Representative . . . *Lawrence N. Doreson* joined as Corporate Manager, Employe Benefits, SSIP & Labor Counsel . . . *Donald A. Buescher* joined as Corporate Financial Analyst - Commercial . . . *Larry J. Pierce* transferred from Convair as Corporate Pricing Specialist . . . *Wesley M. Crocheron* joined as Corporate Manager - Cruise Missile Systems . . . *Donald M. Tye* transferred from Fort Worth as Corporate Langley Representative . . . *Robert V. Spino* joined as Associate Auditor . . . *David G. Stone* transferred from Fort Worth as Corporate Pricing Specialist.

At Stromberg-Carlson: *Paul Bhasin* joined as Manager Final Assembly Manufacturing & Testing at Sanford . . . *Joseph W. Litterer* joined as Manager of DBX Hardware Design at Sanford . . . *Ken L. Keys* joined as Program Manager - Station Apparatus . . . *William N. Martin* joined as Manager Materials at Sanford . . . *Clenton Vandagriff* was promoted to Plant Manager Electro/Mechanical Switching Manufacturing at Rochester . . . *Donald W. Wiles* was promoted to Director of Systems Engineering at Sanford.

At DatagraphiX: *James H. McCormick* was promoted to Sales Manager - Washington, D.C. District . . . *James G. Nicholson* was promoted to Sales Manager - Dallas District . . . *Richard P. Umanzio* was promoted to Sales Manager - Boston District.

At Convair: *A. J. Czak* transferred from Pomona as Engineering Specialist - Senior.

At Fort Worth: *Wendel Elliott* was promoted to Director of Tooling & Manufacturing Development . . . *John W. Harpstrite* was promoted to Manager of Fabrication & Tool Control . . . *Clarance L. Raub* was promoted to Manager of Support Equipment . . . *Cecil D. Ingram* was promoted to Director of Production Planning & Control.

At Pomona: *Fred R. Lee* was promoted to Director of Offsite Operations . . . *Frank Delaney* was appointed Director of Army Marketing . . . *Willis L. Fagg* was promoted to Section Head . . . *James C. Stamper* was promoted to Director, Advanced Standard Missile Programs . . . *James W. Berkovec* joined as Engineering Staff Specialist.

At Electric Boat: *H. J. Nardone* transferred from Quonset Point as Trident Program Manager . . . *Thomas A. Sotir* was promoted to Director - Industrial Relations . . . *C. P. Meyer* and *Leslie A. Morse Jr.*, were named Superintendent - Quonset Point.

At Electronics: *David W. Hoke* transferred from St. Louis as Director of Estimating . . . *Ralph L. Geisberg* was promoted to Director of Systems Engineering . . . *Kenneth L. Horn* was promoted to Engineering Manager . . . *Howard C. McCray* and *Carl D. Nelson* were promoted to Engineering Manager . . . *Lawrence M. Palmer* was promoted to Director of Microelectronics . . . *Kenneth Samples* and *John W. Slattery* were promoted to Engineering Manager . . . *Eric R. Woods* was promoted to Test and Evaluation Director.

At DSS: *John R. Howard* transferred to St. Louis as Technical Systems Specialist - DSS . . . *Herbert C. Conn Jr.* was promoted to Chief Engineering Software at CDSC.

At GDCC: *Edward C. Andler* was named Director of Industrial Relations . . . *Jerome W. Sheehy* was named Director of Marketing Programs.

GD World

Vol. 9 No. 2 | 3 | February 1979

F-16 Goes into Service in Belgian Air Force

By Al Spivak

Europe's first F-16 Multirole Fighter is in service with the Belgian Air Force (BAF) — on schedule and within costs projected when the five-nation program for coproduction of the aircraft began three and a half years ago.

The Belgian Air Force's initial F-16, a twin-seat fighter-trainer, was delivered January 26th at the Charleroi-Gosselies Airport plant of SABCA, the Belgian company which, together with a second firm, SONACA, is assembling 116 of the aircraft for the BAF and 58 for the Royal Danish Air Force.

Next June, the Royal Netherlands Air Force will receive the first of its 102 F-16s at the Fokker-VFW plant near Amsterdam, where an additional 72 F-16s will be assembled for the Royal Norwegian Air Force.

The Belgian delivery followed by three weeks the turnover of the first F-16 to an operational unit of the U.S. Air Force, the 388th Tactical Fighter Wing at Hill AFB, Utah.

"I don't think any of us are astonished or surprised, but we're certainly glad we're here today on schedule," GD Chairman and Chief Executive Officer David S. Lewis told the audience of almost 600 senior governmental, military and industrial representatives who gathered for the delivery.

Mr. Lewis said that it is now important to get "other air forces of the Free World interested in this program" as future purchasers of the F-16, and he said efforts in that direction were "well under way."

SABCA's General Manager P. Georges Willekens hailed the delivery as a "good example of a standardized weapons system for NATO countries" and expressed "sincere gratitude to General Dynamics and to the United States Air Force for continuing support which has helped maintain the harmonious development of this production program."

The F-16's success as an example of NATO weapons standardization was the theme that ran throughout the ceremony.

"Never before in history has the handiwork of so many people, employed by so many companies, dispersed throughout so many nations, been drawn together to perfect one common product to serve their common security," said Rep. James C. Wright, Democrat of Texas and Majority Leader of the U.S. House of Representatives.

"Literally tens of thousands of people in Western Europe and the United States have pooled their labors to produce the F-16," the Congressman said. "The 9,400 skilled workmen at the Fort Worth plant of General Dynamics . . . are linked in a chain of common effort with other Americans employed by 4,700 separate subcontractors in 48 states and the District of Columbia.

Continued on Page 2

Assembled in Europe. *The first F-16 Multirole Fighter assembled in Europe takes off on its acceptance flight (above) after delivery ceremonies (below) at the SABCA plant at Charleroi-Gosselies Airport in Belgium on January 26th. The delivery was on schedule and within costs projected when the five nation program began three years ago.*

Engine Strut Contract Awarded to Convair

Convair Division has entered into a major contract agreement with Boeing Commercial Airplane Co., involving structural work on the new 767 commercial jetliner.

The multimillion dollar contract contains provisions for engine struts for 400 of the new-generation wide-bodied twinjets.

Eighty-four of the 767s have been ordered by four airlines, with first deliveries of the medium-range jetliner slated for mid-1982.

The struts, which will be designed by Boeing to fit three different types of turbofan engines, will be produced at Convair's Lindbergh Field facility.

Tomahawk Flies Antiship Mission Following Launch from Pt. Mugu

A U.S. Navy Tomahawk cruise missile was successfully launched on an antiship mission from a ground platform at the Pacific Missile Test Center, Pt. Mugu, Calif., on January 29th.

The missile flew a long-range, over-the-horizon, target acquisition test flight against a target ship located off the coast of southern California.

The major objectives of the demonstration flight were met, and included ignition of the Tomahawk's solid propellant boost motor and transition to cruise flight of the missile's turbofan sustainer engine. The successful boosted launch accomplished a portion of the test requirements for both the Navy's Sea Launched Cruise Missile and the U.S. Air Force's Ground Launched Cruise Missile.

See Photo Page 4

The Tomahawk was equipped with an antiship missile guidance set with an active radar seeker. After locating the target, the Tomahawk flew over it and then to a recovery area at San Clemente Island.

The missile was recovered on the island and will be used again in the Tomahawk flight test program.

The flight was the 37th flight test for the Convair-built Tomahawk. Designed for both land-attack and ship-attack missions, Tomahawk missiles have accumulated approximately 33 flight hours and have been launched from aircraft, submarines and land platforms.

Convair Division is developing four variants of cruise missiles — two for the Navy and two for the Air Force. For the Navy, Convair is working on Tomahawks with differing guidance systems to perform either land-attack or antiship missions from submarines and surface ships.

An Air Launched Cruise Missile and a Ground Launched Cruise Missile are being developed for the Air Force. Flight testing of the Air Launched Cruise Missile will begin this year at Edwards AFB, Calif.

Sales, Earnings Were Record In 4th Quarter

General Dynamics announced that its earnings for the fourth quarter of 1978 were $48.3 million, or $4.49 per share, on sales of $898 million. Both were records for any three-month period in the company's history.

Earnings for the same period of 1977 were $29.2 million, or $2.73 per share, on sales of $751 million.

The record fourth quarter earnings, combined with the earnings from operations in the previous nine months, significantly minimized the effects of the loss (after taxes) of $186.7 million, or $17.48 per share, which the company reported in the second quarter after reaching a negotiated settlement of its dispute with the U.S. Navy concerning two contracts for construction of SSN 688-class submarines.

David S. Lewis, Chairman and Chief Executive Officer, said that earnings from operations during the year were $138.6 million, or $12.97 per share. After giving effect to the negotiated settlement, a net loss of $48.1 million, or $4.51 per share, was recorded for the year. Earnings in 1977 were $103.4 million, or $9.51 per share. All per share figures are based on the present number of shares outstanding and before the two and one half for one stock split which will be effective Feb. 19, 1979.

"It is disappointing that we must report a loss for the year, but the SSN 688 settlement is now behind us and we are pleased with the improved operating results and the company's substantially improved position for the future," Mr. Lewis said.

Sales for the year ended Dec. 31, 1978, were $3.2 billion, a new record for the company, compared to $2.9 billion for the year earlier.

Lewis said that operating earnings included investment tax credits of $10.2 million for the fourth quarter and $20.7 million for the year ($0.95 and $1.93 per share), attributable to the delivery of two liquefied natural gas tankers owned and chartered by wholly owned subsidiaries. However, an increase in interest expense had a negative effect on the company's earnings.

Backlog at $10 Billion

Total funded backlog at year-end was $10.1 billion, the largest in the company's history, and 58 percent greater than a year earlier. Funded and unfunded backlog was $11.7 billion.

"Of considerable significance is the fact that the backlog figures include only a small portion of the extremely large and long-term F-16 fighter program," Lewis said.

With only a few exceptions, the company's divisions and subsidiaries improved their operating results in 1978, led by especially strong sales and earnings at the aerospace divisions.

Fort Worth Division began deliveries of production F-16 Multirole Fighters to the U.S. Air Force during the year, and the first F-16 assembled in Europe was delivered to the Belgian Air Force in January 1979. The production rate on the F-16 will accelerate in 1979 and 1980, building up to the currently scheduled maximum monthly rate planned for late 1981. Lewis said the program should provide substantial earnings for the company for many years.

Convair Division delivered 26 DC-10 fuselage sections during the year, an increase of nearly 25 percent over 1977, with a significant increase in deliveries scheduled for 1979.

Excellent progress was made on the many key production programs at Pomona and Electronics during 1978. Pomona's efforts on the Standard Missile-2, the Phalanx close-in gun defense system, the Sparrow air-to-air missile and other tactical weapons systems made

Continued on Page 4

Wire Link. *Pam Altemueller, a wire operator in St. Louis, prepares to send a document on a facsimile machine to one of GD's plants.*

Electronic Communications Are Key to GD's Operations

With offices and plants scattered from California to Rhode Island, from Tampa to Belgium and from Texas to Japan, General Dynamics' operations depend on rapid and accurate electronic communications.

Twenty-four hours a day, 365 days a year, a corporate-wide communication system can send and receive verbal and written messages and documents, charts, drawings and photographs to and from GD offices throughout the world.

"Without a doubt, rapid electronic communications is one of the most important reasons General Dynamics is as successful as it is," says John Kane, Corporate Director of Administration.

"While the bulk of our communications today is still carried by the established postal and freight systems, both governmental and private, our extensive electronic communications system is used for high priority, time-sensitive information exchange," says Mr. Kane.

Kane says communication discipline is essential to keeping services effective and cost within reason.

The telephone is electronic communications' most common form at GD, and at the St. Louis headquarters alone, employees have 27 outgoing local lines and 10 Wide Area Telephone Service (WATS) lines which connect them with divisions and locations thousands of miles away. An additional 13 leased lines, called Dynacoms, reach major facilities directly.

Other locations have even more extensive capability. For example, Fort Worth Division has 188 local lines, 18 WATS lines and 29 additional telephone lines which provide Dynacom-type service.

But the telephone is not the only form of electronic communications the corporation uses, because the same cross country lines that carry voices can also transmit written messages electronically.

The information and detail on drawings, reports, photographs and statistical tables are transformed into electronic impulses by facsimile machines using high-speed scanners which then transmit the information and reproduce it at the receiving end. The 'wire rooms' of most GD divisions and plants have at least two facsimile machines that send and receive thousands of messages each year. Fort Worth Division alone has 11 of these machines at different locations across the country and overseas.

Telex machines are used to back up the facsimile machines, and are operated by typing the messages. Many parts of the world communicate primarily by telex, which operates on the same principle as the Morse code, and it is often the best way to reach employees overseas.

EB Delivers Sub 67 Days Early

New York City (SSN696), Electric Boat's fourth 688-class fast-attack submarine, was delivered to the U.S. Navy 67 days ahead of schedule.

The early delivery, on January 23rd, caps a year of on- or ahead-of-schedule deliveries by EB. During 1978, the yard delivered three new attack submarines and one fleet ballistic missile submarine after overhaul, meeting or beating all schedules.

Savings and Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of December were as follows:

Salaried	
Government Bonds	$2.0728
Diversified Portfolio	1.2923
Hourly	
Government Bonds	2.0719
Diversified Portfolio	1.3215
General Dynamics Stock	79.50

Stock Split Will Increase Shares In SSIP Accounts

The decision by the General Dynamics Board of Directors to split the common stock of the corporation two and one half shares for one will affect the accounts of members of the Savings and Stock Investment Plan (SSIP) which hold GD Stock.

Each account which held GD stock prior to the split will receive credit for the extra shares resulting from the split effective Jan. 19, 1979, regardless of whether the shares were purchased by the members' contributions or the corporate contributions.

The cash dividends of 75 cents on the shares held prior to the split will be paid to the Trustee of the SSIP who will use the dividends to purchase additional shares for the members' accounts.

The statements the SSIP members will receive on the status of their accounts as of Dec. 31, 1978, will not reflect either the stock split or the cash dividend because these did not take effect until after the beginning of 1979.

Members who elected to have their 1975 GD stock accounts distributed in 1979 will receive a certificate dated Jan. 18, 1979, for the whole shares the account held as of Dec. 31, 1978, and payment for any fractional shares held as of that date. These members will also receive a separate stock certificate due to the stock split and a dividend payment, both by separate mailing.

First European Assembled F-16 Delivered to Belgian Air Force

Continued from Page 1

"These in turn have placed more than $1.5 billion in major subcontracts with no fewer than 30 European coproducer firms which perform by virtue of an educated and productive working force of thousands of Western Europeans...."

"In this F-16 enterprise, our NATO relationship has grown and matured. No longer one of seller and buyer, of customer and supplier, the relationship is that of partner," he said.

In remarks prepared for the ceremony, Belgian Prime Minister and Minister of Defense Paul Vanden Boeynants said the delivery marked "a major step in an aeronautical program which is not only multinational but also transatlantic.

"Indeed, from today on, the F-16 enters the European theater, opening a new dimension in the operational performance of jet aircraft," the Prime Minister said in the remarks which were delivered at the ceremony by his cabinet director Col. Jacques LeFebvre. "This is a clear demonstration of the management capabilities of the industries which took up the challenge to produce an airplane of that category in such a short time."

Describing the occasion as a "perfect day for the Belgian Air Force," Lt. Gen. Marcel De Smet, Chief of Airstaff of the BAF, said the F-16 program's achievements since the aircraft had been selected in 1975 gave him "great confidence in the future."

Gen. John W. Pauly, Commander of the U.S. Air Forces in Europe, said the Belgian F-16 delivery represented "a hallmark in international cooperation and hard work."

U.S. Air Force Secretary John C. Stetson attended the ceremony, representing Secretary of Defense Harold Brown. Assistant Secretary of Defense John Martin was also there, along with Maj. Gen. James Abrahamson, F-16 System Program Office Director, and members of the Steering Committee of the four European Participating Governments (EPG). Ambassadors to Belgium from each of the three other European countries, and the U.S. Ambassadors to the EPG countries were also on hand.

Following the speeches, the gray camouflaged F-16 taxied out of the huge SABCA hanger with BAF Maj. Guy Devolder in the front seat and U.S. Air Force Lt. Col. Jerry Singleton in the back seat.

Bad weather, which had ranged from snow to rain and ice over the previous week, had prevented completion of the necessary acceptance flights for the BAF, though the aircraft had flown in December to meet other requirements.

It had snowed the night before the ceremony, and the morning was gray and rainy, but the weather began to clear by the time of the noon ceremony and was suitable for the acceptance flight afterward.

While the crowd watched from subfreezing, windswept positions along the runway, the F-16 took off and rose almost vertically into the low-hanging clouds for its acceptance flight to the BAF base at Beauvechain.

Fort Worth Delivers Terminal For Dispersed AF Operations

The prototype of a complete mobile data processing system, with both hardware and software, which allows Air Force commanders at dispersed sites to keep track of a battle situation and receive orders, has been delivered to the U.S. Air Force by Fort Worth Division.

The Remote Data Terminal (RDT), as it is called, can provide commanders of operational units with secure, high-speed communications for receiving, storing and transmitting mission and intelligence messages.

The RDT prototype was developed by Fort Worth and Central Data Systems Center under a $2 million contract from the Electronic Systems Division of the Air Force Systems Command. It provides a mobile, low cost terminal which can connect dispersed units with the Automated Tactical Air Control Center (TACC) – also developed by Fort Worth and under developmental and operational testing by the Air Force.

"A TACC is a mobile command center which can be deployed by the Air Force to control air operations," said Dr. George Davis, Program Manager of the RDT. "Fort Worth has automated a system which previously used teletype and telephone communications and battle displays recorded by grease pencils."

"With an automated TACC, battlefield management becomes faster, more accurate and more responsive to changing requirements," he said.

"The prompt delivery of the RDT is a significant milestone in the development of the TACC Automation program," said Maj. Robert A. Rissell, Chief, Engineering Division, TACC Automation Program Office. "Our initial testing of the RDT demonstrates that it can be a flexible, useful addition to the Air Force inventory."

Fort Worth Receives Citation For Minority Firm Contracting

The Department of Defense has honored Fort Worth Division for its commitment to use minority businesses as subcontractors on high-technology programs.

At a Pentagon ceremony, Deputy Secretary of Defense Charles W. Duncan, Jr. presented a special citation to GD Vice President and Fort Worth General Manager Richard E. Adams for a $1.172 million subcontract by Fort Worth to Univox-California Co., a minority-owned electronics firm. It was the first citation of its kind made by the Department of Defense.

The Los Angeles-based Univox will manufacture 1,083 sets of F-16 cables. Firm contract options, exercisable through 1982, would bring the total Univox contract to $5.4 million – the largest award ever made to a minority-owned firm by GD.

The umbilical cables transmit pilot commands to wing-mounted weapons pylons, for launch of a wide variety of standard and sophisticated air-to-air and air-to-ground ordnance.

"General Dynamics really got behind this thing and pushed it," said Sec. Duncan. He said the company responded "remarkably well" to President Carter's request last year that government agencies and their subcontractors triple the amount of their purchases from minority-owned business in 1977.

"The Department of Defense had stepped up the efforts of its own contracting officers and asked that prime contractors also intensify their efforts," said Budge V. Lee, Minority Business Officer at Fort Worth.

General Dynamics was the first defense contractor in the nation to respond to the President's challenge with a multi-million-dollar purchase.

Newly Modernized. *The Tomahawk Final Assembly and Checkout Facility at Convair has been modernized to provide a controlled environment for precision assembly work.*

Tomahawk Final Assembly Area Modernized for Precision Work

Modernization of the Tomahawk Final Assembly and Checkout Facility has been completed at Convair's Kearny Mesa plant.

"The completion of the facility marks the accomplishment of a major Tomahawk milestone and stands as visible evidence of our corporate commitment to produce the hardware for this important new weapon system," Dr. L. F. Buchanan, Convair General Manager, said.

According to Dick Leonard, Chief of Plant Services – Cruise Missile, the facility encompasses about 30,000 square feet, provides for a controlled environment for precision cruise missile assembly and is designed for easy expansion as production requirements dictate.

Construction in the area involved installation of dropped ceilings, new floor tile, high-pressure sodium lamps, vinyl-covered walls which are moveable and power-operated doors.

"The modernization was planned from the outset for ease of maintenance, employee efficiency and proper environmental controls," Mr. Leonard said.

The new facility will, however, require some rules and restrictions for employees in order to preserve and maintain the controlled environment:

Access to the area is limited to those engaged in specific Tomahawk business – all others should contact the area supervisor when they need to visit the area. Eating, drinking and smoking are prohibited within the area, and the area is closed to both pedestrian and vehicular through traffic.

"My compliments to all who contributed to the timely completion of this excellent new facility and special thanks to all employees for observing the controls necessary to preserve the clean environment," Dr. Buchanan said.

Service Awards

At Convair

30 Years

Operations: F. J. Olin, A. W. Crosthwaite, M. S. Bock Jr., J. C. Hopkins, E. T. Southworth, A. R. Barron Jr., R. E. Sommers, C. W. Hinton, L. A. Rodriguez.

Contracts: J. L. Trenton.

25 Years

Operations: C. H. Sandoval, D. C. Cooper, S. Mazzilli, J. R. Myers, G. A. Gatewood, G. W. Suydam, S. C. Kelly.

Research and Engineering: R. C. Huyett, L. B. Shaw, G. V. Smith, J. W. Richardson.

At Electronics

40 Years

J. W. Cox.

25 Years

R. Conshafter, J. C. Watt, M. Newnum, H. E. Baldwin.

20 Years

J. E. Clark Jr., G. S. Olsen, S. E. Lou, M. D. Holley, R. E. Kranz, R. C. Loew.

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Jack Isabel, Doug Robertson — Contributing editors, Convair Edition

Heizer Appointed VP at Electronics

L. E. Heizer

L. E. (Gene) Heizer, 49, has been appointed Vice President - Research and Engineering for Electronics Division reporting to F. O. Chesus, Electronics' General Manager.

Mr. Heizer previously was Director of Electronic Systems and Laboratories at Fort Worth Division. He replaces Ronald S. Greenslade, who has transferred to Convair Division.

Heizer joined General Dynamics in 1952 as a junior engineer at Fort Worth. During his 26 years with that division he held increasingly responsible management positions, including Group Engineer; Chief of Aerosystems Laboratories; Manager of Aerosystems Laboratories, and Director of Systems Development Laboratories.

A native of Texas, Heizer was graduated from Southern Methodist University in 1952 with a Bachelor of Science degree in electrical engineering. He received his Master of Science degree from Southern Methodist in 1959.

Electronics Receives Award To Develop GPS System

Electronics Division, teamed with Ford Aerospace & Communications Corp., has received a $2.6 million contract for preliminary design of the ground control segment for the NAVSTAR Global Positioning System (GPS).

The division was one of three competitors to receive awards from the Air Force Space and Missile Systems Organization to design the control system. The system will consist of eight monitor stations located around the world and a control center near Fortuna, N.D. The winning contractor will be selected next year for the full-scale development phase of the GPS ground control segment.

In addition, Electronics is teamed as subcontractor with Texas Instruments, Inc., for full-scale development of GPS user equipment. Two teams will be selected later this year to design, develop and field test prototype receivers.

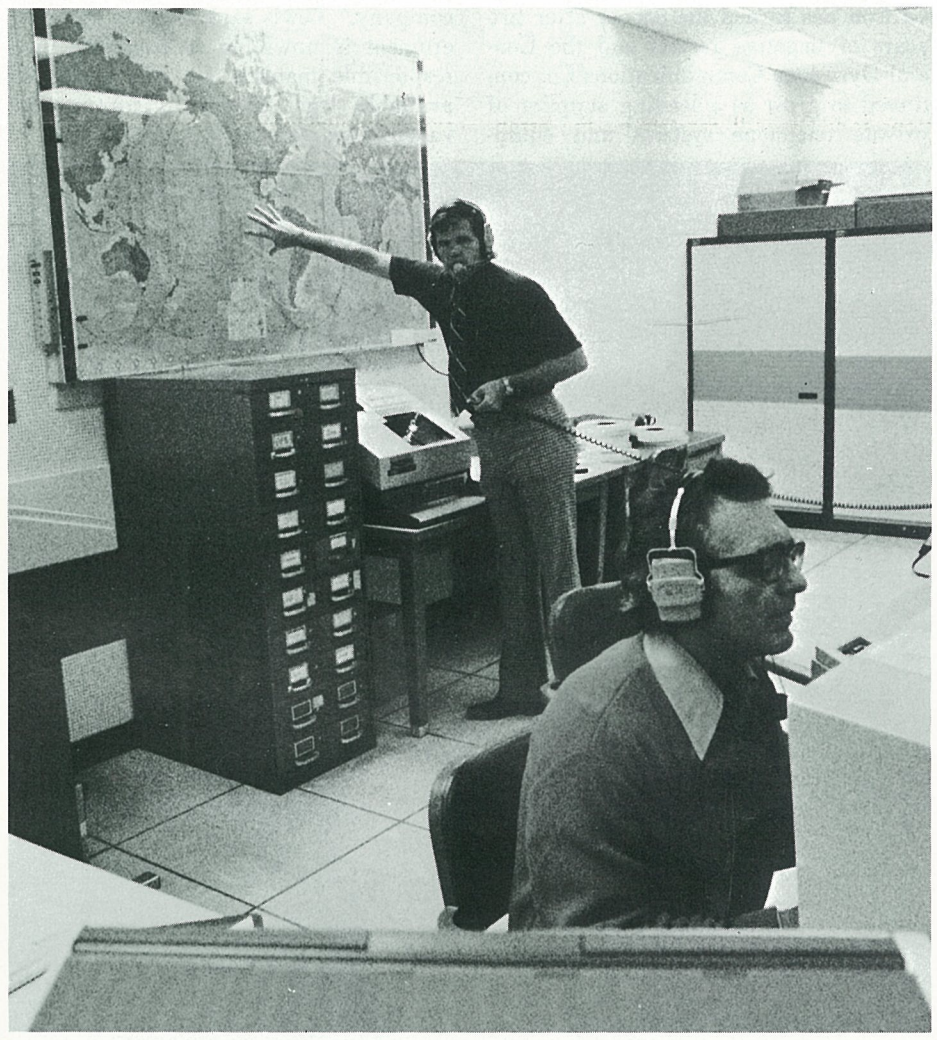
GPS is a high-performance, navigational system that is expected to provide aircraft, surface vehicles, ships and individual soldiers with the capability to make highly accurate determinations of their positions on the Earth using a 24-satellite space network. In any weather, 24 hours a day, satellite data will be available to determine a user's position within a few meters, his speed within a 10th of a knot and the time within a fraction of a second.

Al Taie, GPS Program Manager for the ground control segment, said, "Our design efforts will focus on all elements of the monitor stations and the control center in North Dakota which is the hub of the GPS navigational network. The center, similar to one now operating at Vandenberg AFB, Calif., will include a master control station and an upload station to send and receive data from the orbiting satellites."

The current NAVSTAR working system, consisting of the Vandenberg master control center and four monitor stations in Alaska, Hawaii, Guam and at Vandenberg, will operate for the next several years using four satellites currently in orbit and two others slated for launch later this year. Additional NAVSTAR satellites will start to be launched in 1984, when GPS is expected to become fully operational.

Electronics Division is the system developer and integrator for the existing GPS control and user segments designed during the GPS validation phase. Work by Electronics on that portion of the program will continue through 1983. Efforts include managing and maintaining the center at Vandenberg as well as the four special monitor stations and support of test activity at Yuma Proving Ground in Arizona where GPS is being tested on an inverted range.

Jim Collins, GPS Marketing Manager, commenting on the test activity at Yuma, said, "Position accuracy for high performance aircraft has been consistently demonstrated at 10 meters or less. During bomb drop tests, pilots have navigated to their targets using GPS data and the results have been outstanding."



Vandenberg Center. *Bob Tobiason (left), Electronics Test Director, NAVSTAR GPS, and Charlie McIntyre, Electronics Lead Controller, NAVSTAR GPS, monitor equipment at the NAVSTAR master control center at Vandenberg AFB, Calif.*

Balboa Building Is New Home Of 226 Electronics Employees

Electronics Division has leased office space near its Kearny Mesa Plant to make room for expanding programs.

The office space, located at 8611 Balboa Ave., in the Balboa Building, is within a half-mile of the plant.

So far, 226 employees from offices at Kearny Mesa and Lindbergh Field have been relocated to the new facility.

Program offices relocated to Balboa are: Tactical Data Systems, Global Positioning System, Automatic Test Systems, Systems Engineering, Research and Advanced Projects and portions of Design Engineering.

The telephone number for the Balboa Building is (714) 565-2100 and the mailing address is P.O. Box 85106, San Diego, Calif. 92138.

GD Posts Record 4th Quarter

Continued from Page 1

major contributions to sales and earnings.

At Electronics, production of the F-16 Avionics Intermediate Shop and work on several range-measurement and tracking systems resulted in improved earnings and sales over the previous year.

In the marine area, the Quincy Shipbuilding Division made substantial contributions to earnings during the year. The shipyard delivered three liquefied natural gas (LNG) tankers in 1978 and is scheduled to deliver three more in 1979.

"These deliveries will again contribute major revenues to the company this year, but we are concerned that orders for additional LNG ships have been delayed because of the U.S. Department of Energy's current reluctance to approve LNG import programs," Lewis said. "We are studying other opportunities, including overhaul and repair of nuclear submarines, that will help us keep the fine Quincy shipbuilding team together."

Sales and earnings at the Electric Boat Division were down in 1978, but with the Navy claims settlement out of the way and higher productivity by the division, the company expects a marked improvement in 1979, Lewis said. Electric Boat is scheduled to deliver three SSN 688-class attack submarines during the year, and the first of the seven Trident ballistic submarines currently under contract will be launched this spring.

The telecommunications and data products components were all profitable in 1978 and are expected to improve their performance in 1979. Stromberg-Carlson has turned the corner after two years of negative results and the General Dynamics Communications Co. continued to grow as a leading supplier of private telephone systems and equipment. With the acquisition of the American Telecommunications Corp. in late 1978, the company is optimistic that the telecommunications area will be a major contributor to future earnings.

DatagraphiX, Inc., the computer-output-microfilm subsidiary, maintained its position as the leader in this growing industry with sales and earnings increasing for the sixth consecutive year. Current forecasts indicate DatagraphiX will continue to grow as requirements for improved information and retrieval systems increase.

Resources' Sales Improved

In the natural resources group, Material Service, Marblehead Lime and Freeman United Coal Mining Co. all showed improved sales in 1978. Material Service improved its earnings significantly during the year. Freeman United finally finished the year with a small profit after heavy losses in the first quarter as a result of the nationwide coal miners' strike, Lewis said.

Sales and earnings at Asbestos Corp. Limited (ACL), the company's Canadian subsidiary, were down for the year, primarily as a result of a slackening of worldwide demand for asbestos and due to currency exchange losses.

The Government of Quebec has continued to indicate its intention to acquire Asbestos Corp. To date no negotiations have taken place and the Quebec Government has introduced a bill in the provincial assembly to expropriate the assets of ACL in the event that a satisfactory resolution cannot be reached.

"We are prepared to begin good-faith negotiations with the Quebec Government in order to establish a fair price for our holdings in this very fine company," Lewis said, "but if the Government is unwilling to negotiate in a responsible manner, we will utilize all available legal means to protect our valuable investment."

Keel Laid. *Richard L. O'Shields (left), Chairman of the Board and Chief Executive Officer of Panhandle Eastern Pipe Line Co., prepares to weld his initials on the keel of the liquefied natural gas tanker to be named* Lake Charles *during recent keel laying ceremonies at Quincy. Assisting him is Larry St. John, a Quincy welder, while former Quincy General Manager P. Takis Veliotis, now General Manager of Electric Boat Division, looks on.*

Keel Laid for New Tanker During Ceremony at Quincy

The keel of another liquefied natural gas (LNG) tanker was laid at Quincy Shipbuilding Division on January 30th.

The 175-ton keel section of the huge ship, which will be named *Lake Charles*, was placed on keel blocks during ceremonies at the shipyard.

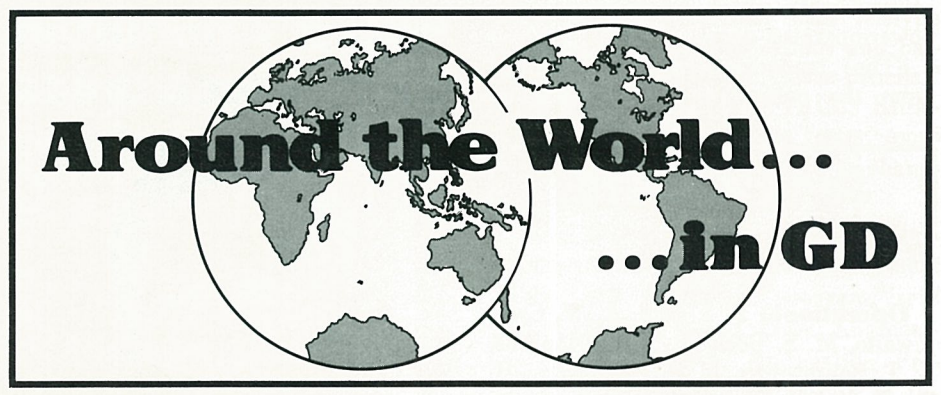
Richard L. O'Shields, Chairman and Chief Executive Officer of Panhandle Eastern Pipe Line Co. of Houston, Tex., welded his initials on the keel with the assistance of Larry St. John, a Quincy welder.

Lake Charles is one of two LNG tankers which will be built for, and jointly owned and operated by, Panhandle Eastern, General Dynamics and Moore-McCormack. The partnership will operate under the name of Lachmar.

Also participating in the event were David S. Lewis, GD's Chairman and Chief Executive Officer, and James R. Barker, Chairman and Chief Executive Officer of Moore-McCormack.

Lake Charles and her sistership will transport LNG from Algeria to the United States under a gas purchase contract between Panhandle and Sonatrach, the national oil and gas company of Algeria.

Lift Off. *A Convair-built U.S. Navy Tomahawk cruise missile is launched from a ground platform at the Pacific Missile Test Center at Pt. Mugu, Calif. The missile flew a successful test flight against a target ship located off the coast of southern California (See Story Page 1).*



At CHQ: *Lillie L. Lane* joined as Corporate Pricing Specialist . . . *Jay R. Colvin* transferred from Convair as Corporate Manager, Personnel Placement . . . *Ray D. Jones* transferred from Convair as Corporate Marketing Manager - Europe . . . *Ronald H. Beatty* transferred from Electric Boat as Corporate Manager, Industrial Security . . . *Peter L. Fullinwider* joined as Corporate Manager, International Programs . . . *Henry L. Burghard* joined as Director of Corporate Accounting . . . *Jack F. Isabel* was promoted to Corporate Manager of News & Information - Western Region . . . *Douglas A. Robertson* transferred from Pomona as Corporate News & Information Specialist, Sr. - Western Region.

At Stromberg-Carlson: *Louis M. Whitney* transferred from St. Louis as Director of Industrial Relations for S-C operations in central Florida . . . *Donald R. Merriam* was promoted to Manager, Analog Engineering at Rochester.

At Convair: *R. S. Greenslade* transferred from Electronics as Senior Technical Staff Member.

At Electric Boat: *William D. Fossum* was promoted to Manager - Automated Manufacturing Facility . . . *Charles E. Aldrich Jr.* was promoted to Chief Engineer . . . *Peter G. Ladd* was promoted to General Superintendent.

At Pomona: *Edward J. Fikse* was promoted to Section Head . . . *Donald D. Skinner* was promoted to Assistant Program Director . . . *W. M. Reed* transferred from Electronics as Purchasing Agent . . . *Charles E. Reno* was promoted to Engineering Manager . . . *Robert F. Glass* was promoted to Aviation Manager.

At Fort Worth: *David O. Jordan* was promoted to F-16 Production Director . . . *Raymond K. Pilon* joined as Manager of Quality Assurance . . . *Joseph A. Porch* joined as Manager of Contracts . . . *Neil R. Anderson* was promoted to Engineering Director.

At Electronics: *Franklin B. Osgood* joined as Program Manager . . . *Russell H. Romney* joined as Principal Engineer.

At GDCC: *Larry C. Hemmelgarn* joined as District Manager . . . *John W. Burger* was promoted to Vice President Communications Systems.

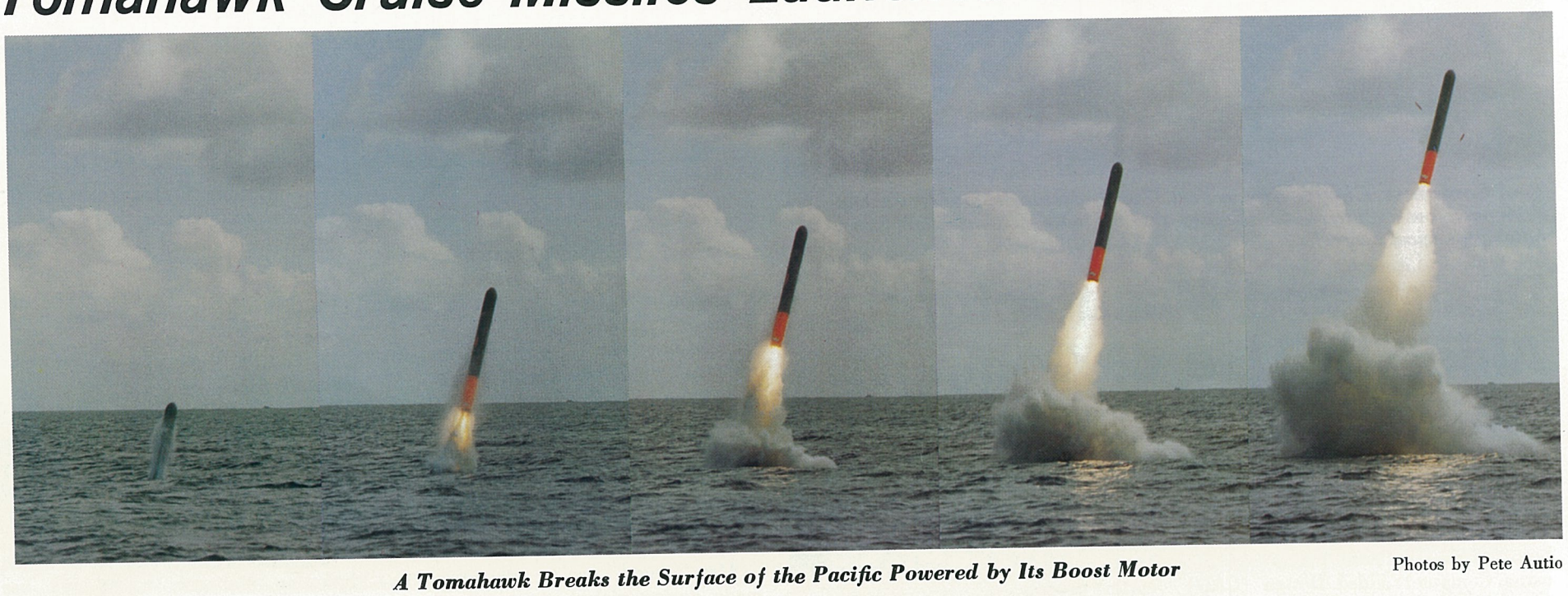
At Freeman United: *Steve S. Rowland* joined as Superintendent of Orient No. 6 mine.

GD World

Vol. 9 No. 3 3 March 1979

Inside the World

Tomahawk Cruise Missiles Launched from Submarine



A Tomahawk Breaks the Surface of the Pacific Powered by Its Boost Motor

Photos by Pete Autio

By Doug Robertson

"T-minus sixty seconds and counting . . . . "

The crisp, metallic voice from the outdoor loudspeaker cut through the chill winds blowing across San Clemente Island 20 miles off the coast of southern California on Feb. 22, 1979. Observers were gathered on a high hill, focusing their attention on the surface of the Pacific several hundred feet below.

In less than a minute, Convair's newest U.S. Navy Tomahawk cruise missile, designated T24, was expected to hurtle from the ocean's depths and make a smooth—and vital—transition from its powerful booster to its turbofan cruise engine.

The launch, the second in eight days, was to be made from a torpedo tube of the attack submarine USS *Guitarro* (SSN665), unseen below the surface of the ocean.

"T-minus thirty seconds . . . ."

This test flight would be the fourth in the last several months. Those tests included an air launch of Tomahawk which began the second phase of the survivability test program in December, a launch from a ground platform at the Pacific Missile Test Center at Pt. Mugu, Calif., and then the February 14th submarine launch from the USS *Guitarro*. All three had been unqualified successes.

"T-minus twenty seconds . . . ."

A paravane towed aft of the submerged USS *Guitarro* presented the observers with their sole reference point, and as binoculars were being given final focusing, there was much speculation as to where T24 would broach the water.

Among the observers was Rear Adm. Walter M. Locke, Director of the Joint Cruise Missile Project Office. Following the successful flight of T20 from the submarine the previous week, the admiral had sent a message to the Convair team involved in the program which said in part, "I wish to commend each of the activities which supported T20. Please express my sincerest appreciation to each of those individuals who has been working so hard to prepare the missile."

"T-minus ten seconds . . . . "

T24 was designed to again test Tomahawk's long-range, over-the-horizon capability to search for, locate and simulate an attack on a target ship at sea. Other major objectives included near real-time targeting, underwater ignition of the missile's solid propellant boost motor, separation of the shrouds and booster, performance of the redesigned sealing system to ensure that no water entered the missile, transition to cruise flight and recovery on the island about an hour later.

Five . . . four . . . three . . . two . . . one . . . . "

The missile took a little more than six seconds after it left the torpedo tube to break the surface of the water, although it seemed much longer.

Then, amid cheers from the onlookers, T24 leaped from the sea with a roar, and, trailing a white plume, soared into the sky. Moments later, the booster fell away, the turbofan cruise engine took over, and the flight was under way.

That evening, in remarks prepared for representatives of the Association of Unmanned Vehicles, Adm. Locke said, "Within a period of less than a month, we have conducted three straight successful launches of the Navy's Tomahawk cruise missile. All three launches involved the antiship Tomahawk. In each case, all objectives were met, including the missile going from boost to sustained cruise flight.

"I personally feel that these three significant events have put us back on the track with the Navy's sea-launched cruise missile project."

Ready for Duty. ***The Electronics-built Asiak environmental data buoy needed only minor repairs after it was torn from its mooring and drifted 450 miles in frigid, storm ravaged seas off the coast of Greenland (See story page 2).***

Executives Named to Head Air Launched Cruise Missile

Three of the company's top engineering and manufacturing executives have been appointed to key positions on the Air Launched Cruise Missile (ALCM) program at Convair.

William C. Dietz, Fort Worth Vice President for F-16 Engineering, has been named Convair Vice President and Program Director for ALCM. Bernard J. Kuchta, Director of the Tomahawk Air Launched Cruise Missile Program, was appointed Director of ALCM Development, and Dan C. Wilson, Director of F-16 Production at Fort Worth, has been appointed Director of Production for the ALCM program.

Designated the AGM-109, the General Dynamics ALCM will compete for Air Force production contracts in operational tests against an ALCM designed by Boeing, with the final decision expected in about a year.

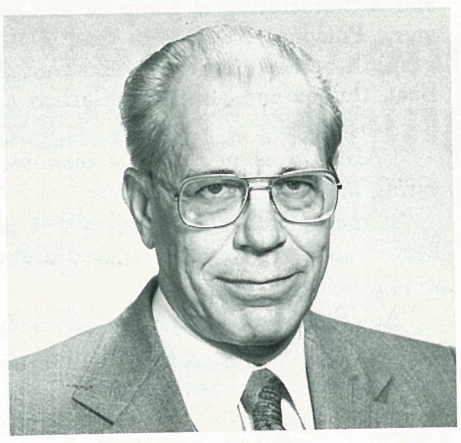
Mr. Dietz, who will have responsibility for the entire ALCM program, has been responsible for all engineering activities for full-scale development and production of the F-16.

He joined the company in 1940 and has held a number of progressively more important engineering positions including Project Leader for the B-58 bomber and Chief Engineer for the F-111 fighter-bomber.

In 1971, he was assigned to the Lightweight Fighter Prototype Program, and, the following year, he was named Engineering Director for the YF-16 program. He was appointed Vice President of F-16 Engineering in 1974.

Mr. Kuchta joined the company in 1957 as an Associate Engineer. During his career with the Convair Division he has held increasingly responsible positions in engineering and program management.

He was awarded a Bachelor of Science degree in Mechanical Engineering from the New Jersey Institute of Technology in 1957 and holds a Master of Science degree in Aerospace Engineering from San Diego State University. He is an Associate Professor of Aerospace Engineering at San Diego State.



William C. Dietz

Dietz holds a bachelor's degree in aeronautical engineering from Aeronautical University in Chicago and is a recipient of the Reed Aeronautics Award of the American Institute of Aeronautics and Astronautics.

In Mr. Wilson's most recent assignment at Fort Worth Division, he was responsible for the development and implementation of the production plan for the F-16.

He joined the company in 1946 as a stress analyst and has progressed through engineering and production assignments including Structures Engineer, Design Group Leader, Project Engineer and Manager of Manufacturing Engineering.

Wilson was graduated from Texas A & M University in 1942 with a bachelor's degree in civil engineering.

Trident Sub Launching Set For April 7th

The nation's first Trident missile submarine, the *Ohio*, will be christened and the keel of the fourth Trident, the *Georgia*, will be laid during ceremonies at Electric Boat Division on April 7th.

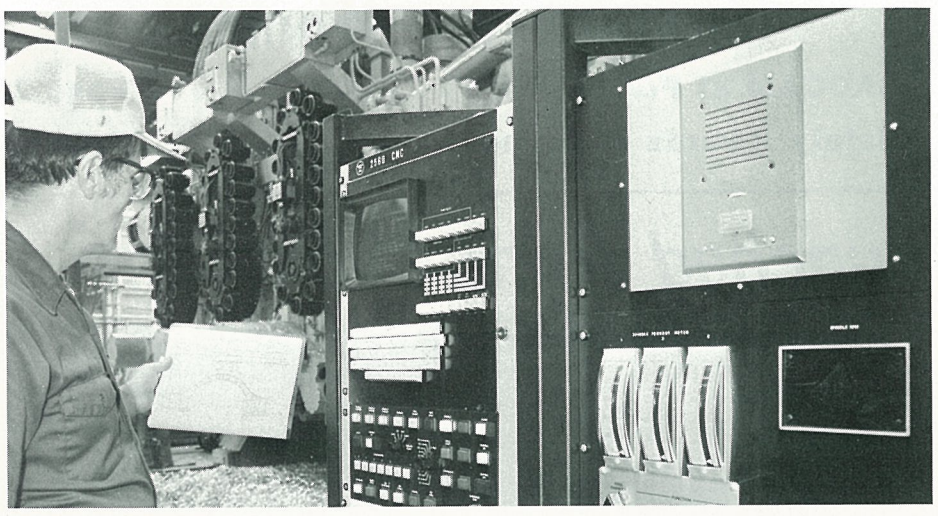
Mrs. Rosalynn Carter, wife of President Carter, will weld her initials into the keel of the *Georgia* (SSBN729) during the ceremony which signifies formal start of construction.

The *Ohio* (SSBN726) will be christened by Mrs. Anna Glenn, wife of Senator John Glenn, Democrat of Ohio, who will speak at the ceremony.

Both the *Ohio* and the *Georgia* are 560 feet long and will displace 18,750 tons. They will carry crews of 14 officers and 140 enlisted men, and each will serve as an undersea launch platform for 24 long-range strategic missiles.

See Related Photo Page 4

Trident submarines offer significant improvements over the aging fleet of Polaris/Poseidon missile submarines they will replace. Tridents' major advantages include more missiles, better survivability, more time on station, increased operating area, better crew living conditions and larger and more sensitive sonar equipment.



Tool Controller. *Charles Kite, a Fort Worth machinist, prepares to machine F-16 parts on a Cincinnati Milacron three-spindle, five-axis tool using computer numerical control.*

Design and Manufacturing Aided by Use of Computers

When the first two-seat F-16B made its maiden flight last year, it contained a small part that was the result of GD new manufacturing techniques that will be used widely in coming years.

The part, a rear engine mount, had been designed by Fort Worth engineers using Computer Aided Design (CAD) and had been machined by a tool controlled by Computer Aided Manufacturing (CAM).

In the future, Fort Worth Division will be using more and more CADCAM in its processes, according to Don H. Huckaby, Director of the Central Data Systems Center (CDSC).

"The improved efficiency that results from using CADCAM processes translates to lower cost in aircraft manufacturing," says James E. Ashton, Fort Worth's Vice President of Production. "At a time when governmental expenditures are being subjected to increasing scrutiny, lower cost is one of the keys to ensure a sustained production program."

"We began working on CADCAM several years ago," Mr. Huckaby says. "Just now we are beginning to see the results of thousands of hours of planning and work."

In designing an F-16 part, for example, the geometry of the part can be formed on a graphics terminal.

Once the geometry of the part has been formed and checked, the dimensional information is stored in a computer – it is available to be transmitted to a plotter if a printed document is needed.

If the part must be changed, it doesn't have to be redrawn. It is merely recalled on the graphics display and changed.

"In the past when a part changed, the whole series of new drawings had to be made on the drafting table," Huckaby says.

After the part is designed, the geometry information is then translated into instructions for a machine tool and stored in a main computer. When a tool has been prepared to machine the part, the computer information is put on Mylar tape which is then used to control the cutting process.

CDSC is currently putting in a direct numerical control (DNC) system which will receive the machining instructions directly from the main computer and transmit them to the machine tool – eliminating even the tape.

At the side of each machine tool, Fort Worth has installed a computer numerical control (CNC) system which will not only control the tool, but will supply the DNC computer with production, performance and status information for management decisions.

Fort Worth is currently installing four 90-foot bed, five-axis, three-spindle machine tools and two 75-foot bed tools, all of which will be controlled by CNC.

Initially, more than 20 other tools at Fort Worth will be controlled by computers which have a capacity of handling as many as 50 tools.

At the present time, the CADCAM effort at Fort Worth is the most advanced in General Dynamics. Other work on harnessing the computer for design and manufacturing is going on at Convair, Pomona, Electronics and DatagraphiX on the West Coast, and Electric Boat, Quincy and Stromberg-Carlson on the East Coast.

"CADCAM is new to GD manufacturing methods," says Huckaby.

"It means that our products will be better and much more economically produced," he says.

"At a time when we must be extremely cost conscious for competitive reasons, these are very important advantages."

Six GD Units Win Awards For Safety Performance

Six General Dynamics divisions, subsidiaries and plants have earned the Chairman's Award for Excellence in Safety and Performance for 1978.

The winners are Convair, Electronics, DatagraphiX, Fort Worth, Pomona and the Sanford Facility of Stromberg-Carlson in Florida. They compiled safety records which are substantially better than the averages for their industries and have conducted active and comprehensive loss control programs which meet or exceed corporate standards, according to David Lavalette, Corporate Manager, Safety and Health.

In addition, the following locations compiled overall records which were significantly better than the averages for their respective industries: the Charleston Facility, Electric Boat-Groton, Marblehead Lime, Material Service, Quincy Shipbuilding, Quonset Point and Stromberg-Carlson's Rochester Plant.

"On a corporate-wide basis, lost workday and recordable injury incidence rates were 10 percent and 7 percent better than in 1977 and were 10 percent and 21 percent better than weighted averages for the industries in which we are engaged," said Mr. Lavalette.

Savings and Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of January are as follows:

Salaried	
Government Bonds	$2.0961
Diversified Portfolio	1.3380
Hourly	
Government Bonds	2.0953
Diversified Portfolio	1.3686
General Dynamics Stock	33.60

Data Buoy Needs Minor Repairs After Voyage on Stormy Seas

An environmental data buoy, built by Electronics Division for ESSO Resources Canada Ltd., will go back on station this spring after demonstrating its reliability in the frigid, storm-ravaged waters off the coast of Labrador.

The buoy, named "Asiak" after the Eskimo goddess of weather, broke loose from its moorings, drifted 450 miles until it was recovered and then capsized

See Photo Page 1

while being towed to a safe harbor. But in spite of its ordeal, Asiak needed only minor repairs.

The ordeal for Asiak began last October. The 10-meter Production Environmental Buoy had been performing well on its station about 150 miles east of Ungava Bay before it was torn from its moorings, apparently by heavy ice.

Drifting with the currents in Davis Strait, which lies between Labrador and Greenland, Asiak was tracked by the Geostationary Operational Environmental Satellite as it was buffeted by fierce arctic winds to a position 450 miles from its station.

After several recovery attempts were made during violent storms, the buoy was finally placed under tow, but enroute to St. John's, Newfoundland, it was turned over by mountainous seas and 70-knot winds.

George Goddard and Gordon Brickson of Electronics were sent from San Diego to Newfoundland to supervise the righting of Asiak and to assess the damage it had incurred.

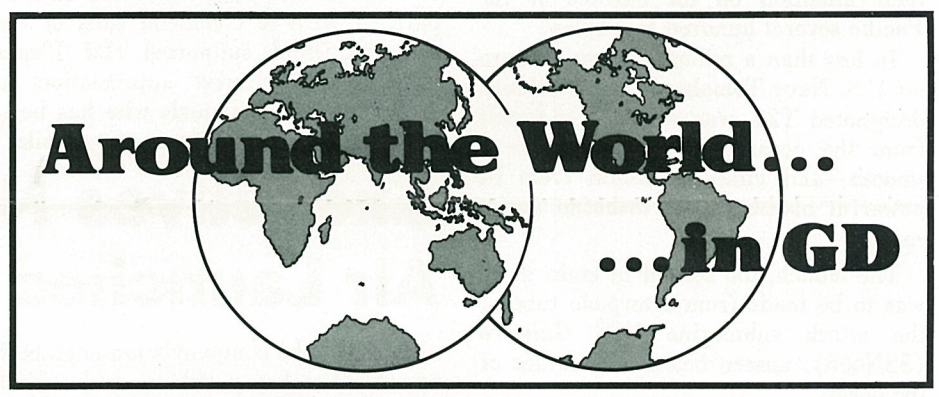
According to Mr. Goddard, although the upper structure of the buoy was damaged in the upset, all internal electronic systems survived. The electronic payload had been immersed in 18 inches of sea water which was contaminated by battery acid, but since the payload components were housed in nitrogen pressurized containers, they were undamaged. Only the upper structure and the sensors which were installed there required replacement.

The electronic packages aboard the buoy were returned to San Diego for analysis and checkout under the supervision of Goddard.

"We bench checked the components and found that all systems were operating to specifications," he said. "Only minor repairs, checkout and recertification were necessary."

He said the 60-ton buoy was designed for three years of unattended operation on station and noted that buoys built by Electronics have routinely demonstrated highly reliable operation in various locations around the world.

According to Bill Wilson, Electronics Marketing Manager, ESSO will use Asiak and another, similar buoy it recently ordered to support exploratory oil drilling operations. Plans for drilling off the coast of Labrador depend on the acquisition of meteorological and oceanographic data. Mr. Wilson said data on wave height, water temperature, wind velocity and barometric pressure will be acquired and relayed by the buoys to a shore station at St. John's.



At CHQ: *Joseph H. Landis* joined as Corporate Pricing Analyst . . . *Jay R. Colvin* transferred from Convair as Corporate Manager Personnel Placement . . . *Lee D. Leipold* joined as Cash Administrator . . . *Frank C. Schoen* joined as Subcontract Auditor . . . *Timm L. Fair* was promoted to Internal Audit Specialist - International . . . *George M. Gales* was promoted to Corporate Flight Captain . . . *Gary M. Rust* joined as Corporate Tax Administrator . . . *Robert W. Swift* joined as Corporate Staff Accountant . . . *Henry L. Burghard* joined as Director of Corporate Accounting.

At Electronics: *Jerry Tanaka* transferred from St. Louis as Project Manager . . . *David A. Plutchak* was promoted to Engineering Manager . . . *Robert A. Davis* joined as Program Manager . . . *Elvis Skidgel* joined as Section Head - Engineering , , , *Joseph L. Roberti* was promoted to Section Head - Engineering.

At Fort Worth: *Jesse M. Boulware* was promoted to Assistant Project Engineer . . . *Larry N. Lydick* was promoted to Project Engineer . . . *Joseph F. Podesta* was promoted to Project Manager . . . *Frank E. Riney* was promoted to Manager of Estimating & Proposal Services . . . *Max E. Waddoups Jr.* was promoted to Engineering Program Manager . . . *Wilfred D. Varley* was promoted to Assistant Project Engineer . . . *Douglas B. Kelty* was promoted to F-16 Production Manager - International.

At DatagraphiX: *Bob Orr* was promoted to Purchasing Agent - Mechanical/ Fabricated parts . . . *Doug Mee* was appointed Manager of Logistics . . . *Ed Hale* was appointed Manager of Support Services . . . *Kim Mercer* was appointed Supervisor of Manufacturing of the 132A/B Display Product Line . . . *Ed Wright* was promoted to Manager of Production and Industrial Engineering.

At Pomona: *John J. Shore III* joined as Engineering Specialist . . . *Richard M. Miller* and *David M. Crawford Jr.* joined as Marketing Representatives - International . . . *Michael J. Hicks* joined as Internal Communications Specialist . . . *D. K. Lockerby* was promoted to Supervisor of Accounts Payable . . . *Glenn R. Barr* was promoted to Project Engineer . . . *W. L. Chittick* joined as Manager of Manufacturing Engineering - DIVAD . . . *Harvey H. Derne* was promoted to Manager - Sparrow Program Administration.

At Convair: *J. E. Board* transferred from Electronics as Engineering Specialist . . . *J. William Kittle* was promoted to Engineering Chief.

At Freeman United: *Austin D. Anderson* joined as Director, Reserve and Land Acquisitions.

At Stromberg-Carlson: *Lawrence K. Tate* was promoted to Manager of Station Apparatus Operations at Charleston . . . *James A. Giuliano* was promoted to Digital Systems Controller at Sanford . . . *George J. Singleton* was promoted to Manager, Manufacturing Support at Sanford . . . *Anthony Horvath* joined as Manager of Product Planning.

At GDCC: *John W. Mills Jr.* was named Boston District Manager . . . *Robert O. Shaw* was named Seattle District Manager . . . *Robert T. Hughes* was named Product Marketing Manager.

In-Plant Briefing. *John C. Stetson (left), Secretary of the Air Force, and Brig. Gen. John T. Chain, Military Aide to the Secretary, listen as Dr. L. F. Buchanan (right), Convair's General Manager, describes techniques being used in development of the Air Launched Cruise Missile. During his recent half-day visit at Convair, the Secretary received briefings on cruise missile programs and toured the facilities.*

Electronics Has Built More Than 50 Environmental Data Buoys

More than 50 environmental data buoys built by Electronics Division have been deployed since 1960, and there is more potential business on the horizon, according to Bill Wilson, Electronics Marketing Manager for the buoy program.

"The U.S. Climate Program under the auspices of the National Oceanic and Atmospheric Administration," he said, "will require a large number of data buoys in the northern Pacific." The region is known to be one that directly affects the major meteorological phenomena which control the weather in North America.

Mr. Wilson says the extremely cold winters of the past few years and the drought conditions along the West Coast were directly related to oceanographic temperature patterns in the northwestern Pacific.

"Precise measurements of the sea surface patterns and temperature profiles are essential parameters used for long-range weather forecasting," he said. "Those parameters can be obtained from buoys, and they provide a base for other data obtained from meteorological satellites."

The buoys are complementary to satellite systems and provide unique data required by the newly established U.S. Climate Program.

"We are looking to a vigorous, long-range undertaking by the government which will require a large number of buoys and the development of new buoy technology," Wilson said. "The Climate Program will help those involved in the environmental sciences understand and eventually predict long-term conditions that affect the country's weather and climatology."

GD Helps Record Solar Eclipse By Modifying a USAF Aircraft

General Dynamics had a hand in recording a rare solar eclipse for scientists and millions of television viewers on February 26th.

Twenty GD technicians helped scientists and the U.S. Air Force modify a USAF C-135 aircraft to carry the cameras that photographed the eclipse from seven and one half miles above Montana and North Dakota.

General Dynamics' Albuquerque Operation, headed by A. M. Veed, designed and installed the delicate tracking systems to keep the cameras fixed on the sun's corona. Mr. Veed's group also installed the two 22-inch diameter optical glass windows through which still and television cameras peered.

Veed and associate B. A. Jones were aboard the C-135 for the mission. Veed was responsible for maintenance of general aircraft systems during the flight, while Mr. Jones' role was to insure that cameras kept the sun in the bulls-eye of their field of view.

By tracking the solar event at an airspeed of 470 miles per hour, the airborne observatory doubled eclipse viewing time compared to that available to ground observers. The six-hour mission yielded a four-minute portrait of totality, the period when the moon obliterates all but a narrow, fiery rim of the sun – the corona.

The 170-190 mile-wide path of totality stretched from the north Pacific at sunrise across Portland, Ore., Helena, Mont., and Winnipeg, Man., Canada, ending in northern Greenland at sunset. The C-135 airborne observatory, operated by the 4950th Test Wing, took off from Kirtland AFB, N. M., and intercepted the eclipse path near Great Falls, Mont. After lock-on, the C-135 photographed the eclipse with starboard cameras while traveling east toward Minot, N. D.

ALCM Training. *Convair Instructor Don Marasky (center) reviews a rotary launcher loaded with AGM-109 Air Launched Cruise Missiles (ALCM) for Air Force personnel. Nearly 100 Air Force personnel from several service commands are taking part in the ALCM training program which runs through June at Convair.*

USAF Personnel Receive ALCM Training at Convair

Nearly 100 U.S. Air Force personnel are being trained on the AGM-109 Air Launched Cruise Missile at Convair Division.

According to Dan Kolb, Convair Logistics Operations Training Group Leader, the training consists of five courses which cover ordnance, test, maintenance, instrumentation packages and automatic test equipment repair.

The Air Force personnel represent the Air Force Logistics Command, the Strategic Air Command, the Air Training Command and the Air Force Test and Evaluation Center at Edwards AFB.

"Most of those taking part in the training will be assigned to the AGM-109 for the flyoff competition at Edwards," Mr. Kolb said. "The training will acquaint them with the AGM-109 weapon system so they can understand and evaluate its operational capabilities."

Two of the five courses have already been completed. A course in Explosive Ordnance Disposal was taught by Bob Gainley. Tom Marsh, Fred Johnson, Don Marasky, Marian Martin, Gainley and Kolb, all from the Logistics Training Group, were instructors for a Test Engineering Course which was completed in February.

Many Fort Worth Employees Are Learning to Save Lives

CPRs are lifesavers at Fort Worth, and you can identify them at a glance.

Employees who have completed the Red Cross' Cardiopulmonary Resuscitation (CPR) course wear a CPR emblem on their identification badges. So far, 746 Fort Worth employees have become entitled to wear the emblems. Another 600 are expected to complete lifesaving training this year. At that time, more than 10 percent of Fort Worth's employees will have been trained in CPR. The ultimate goal is 25 percent.

The course is provided by the Fort Worth Management Association and utilizes lifelike mannequins for training aids. The mannequins respond like humans to chest pressure and mouth-to-mouth resuscitory techniques.

From a borrowed mannequin and instructor a few years ago, the Management Association's CPR program has grown to 26 Red Cross certified employee instructors and 11 mannequins.

Special GD 5-Hour Party To Be Held at Disneyland

The Magic Kingdom of Disneyland has been leased for a special five-hour General Dynamics party Saturday, March 24th.

The 15th Annual Family Fun Night is sponsored by the Convair Management Association and is open to all employees of General Dynamics, their families and guests. Admission tickets, at $5.50 each, are now on sale at Convair's Kearny Mesa and Lindbergh Field plants, Air Force Plant 19, the Convair Recreation Association Clubhouse, and the Electronics Division. Children two years and under are admitted free. No tickets will be sold at the Disneyland gates.

Disneyland will be open exclusively from 8:30 p.m. to 1:30 a.m. to General Dynamics' special ticket holders only. The one admission price covers parking and unlimited use of all rides and attractions except shooting galleries. Musical entertainment at various locations in the park will be provided for listening and dancing.

Round-trip charter bus service will be provided from the Kearny Mesa Plant to Disneyland. The cost is $5 per person.

Convair Service Awards

35 Years

Operations: D. F. Winters, T. Jones.

Research and Engineering: R. D. Howard.

30 Years

Operations: G. R. Wilcox, C. W. Hinton, P. R. Carlton Jr., L. C. McCurry.

25 Years

Operations: J. R. Myers, S. M. Elson, G. A. Gatewood, G. W. Suydam, S. C. Kelly, D. N. Wells, M. B. Morse.

Research and Engineering: E. A. Roakes, A. D. Mattia, L. B. Shaw, R. C. Huyett.

20 Years

At Electronics: V. E. Klundt.

GD World

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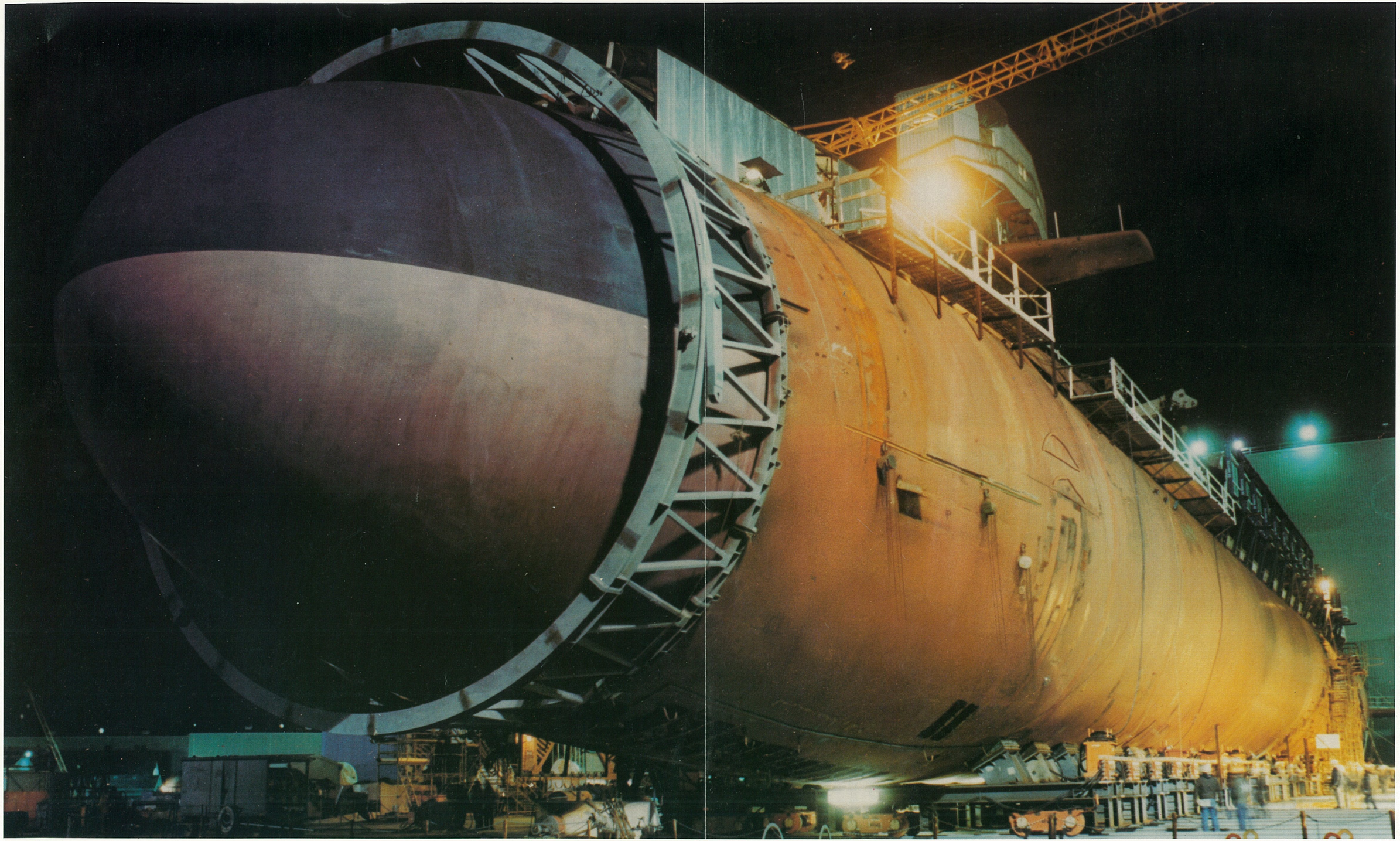
L. Christine Cascella — Associate writer

Jack Isabel, Doug Robertson — Contributing editors, Convair Edition



Christening Scheduled. *The first Trident missile submarine, the* Ohio, *is shown being readied for its April 7th christening in this dramatic nighttime photograph, one of the first pictures of the* Ohio *authorized for publication. The 560-foot-long submarine, the world's largest undersea vessel, is positioned on the new $140 million Submarine Land Level Construction Facility at General Dynamics' Electric Boat Division (See Story Page 1).*

GD World

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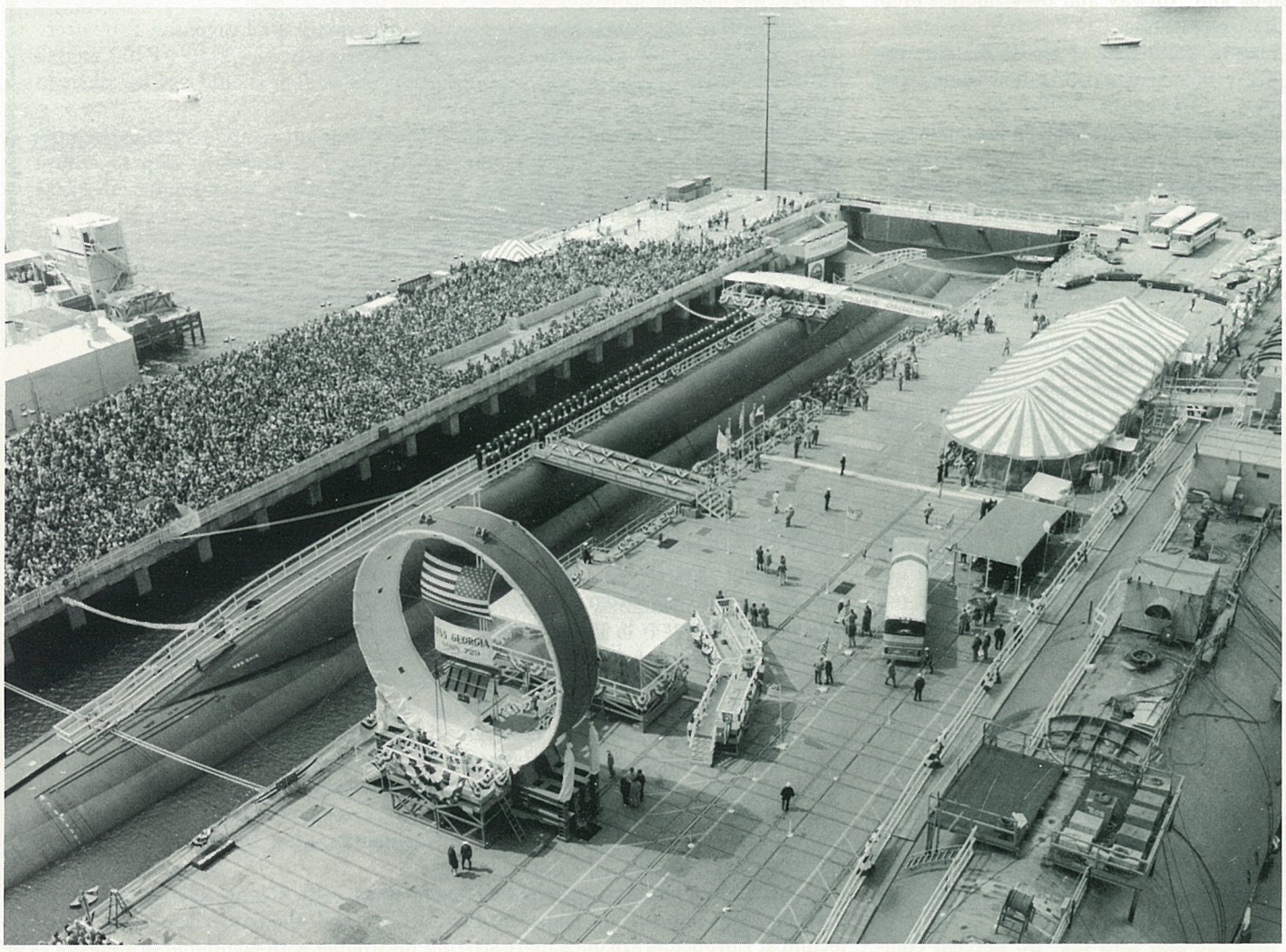
Inside the World

First Trident Submarine Christened at Groton



Dual Ceremony. *Thousands of guests line the graving dock where the Trident submarine* Ohio *floats during her christening ceremony. In the center foreground, the hull cylinder of* Georgia *waits for the keel-laying ceremony, while at the right is the partially completed* Michigan.

Mrs. Carter Initials Keel Of Georgia

The U.S. Navy's first Trident submarine, the *Ohio*, was christened by Mrs. Annie Glenn, wife of Senator John H. Glenn of Ohio, and the keel of another Trident, the *Georgia*, was laid by Mrs. Rosalynn Carter, wife of President Carter, in dual ceremonies at Electric Boat on April 7th.

As a cold, biting wind blew across the Thames River, a crowd of more than 20,000 watched as Mrs. Glenn said, "In the name of the United States, I christen thee *Ohio* — may God bless her and all who sail in her." Moments later she smashed the traditional bottle of champagne against *Ohio's* sail.

Then it was the *Georgia's* turn, and Mrs. Carter welded her initials—RSC—into the keel plate of the submarine. After completing the weld, Mrs. Carter said, "I declare the keel of the *Georgia* to be well and truly laid."

The crowd assembled alongside the 560-foot-long *Ohio* (SSBN726) which was afloat in the graving dock of EB's $140 million Land Level Submarine Construction Facility. On the north side of the dock stood the partially completed *Michigan* (SSBN727) and the hull cylinder of the *Georgia* (SSBN729).

David S. Lewis, Chairman and Chief Executive Officer, introduced Senator Glenn, who gave the principal address for the *Ohio* christening. After describing the ships which had previously held the name *Ohio*, he said, "We christen this *Ohio* to go in peace and to maintain peace. We pray that its awesome power will be a deterrent to any conflict in the future and that it will never be used."

For the *Georgia's* keel laying, Mrs. Carter was introduced by Adm. Hyman Rickover, Director of the Naval Nuclear Propulsion Program.

In her remarks, the First Lady noted the long-term influence Adm. Rickover has had on her husband —an influence which began at Electric Boat in 1952 when the Carters saw him during the keel laying ceremony of the world's first nuclear submarine, the *Nautilus*.

Turning to the importance of the submarine force to national defense, Mrs. Carter quoted the President, saying, "If there ever has been any single weapon system that has insured our nation's security, it has been the nuclear submarine with a strategic weapons capability."

EB General Manager P. Takis Veliotis, said, "We are very proud that the Navy's Trident submarine fleet is under construction at Electric Boat."

Guests for the dual ceremonies included: Connecticut Senator Abraham A. Ribicoff and Representative Christopher J. Dodd; Adm. Thomas B. Hayward, Chief of Naval Operations; Vice Adm. C. R. Bryan, Commander, Naval Sea Systems Command; and Vice Adm. Kenneth M. Carr, Commander, Submarine Force Atlantic Fleet.

Other platform guests included Gov. Ella Grasso of Connecticut, Gov. J. Joseph Garrahy of Rhode Island, Lt. Gov. George V. Voinovich of Ohio and Lt. Gov. Zell Miller of Georgia.

Electric Boat has contracts to build seven *Ohio* class Trident missile submarines. Each vessel will carry 24 Trident intercontinental ballistic missiles which possess greater range than earlier Polaris or Poseidon missiles.

The *Ohio* class submarines weigh 18,750 tons and carry a crew of 154.

LNG Libra Named at Quincy Ceremony

LNG Libra, the latest addition to America's growing fleet of liquefied natural gas (LNG) tankers, was named during ceremonies at Quincy Shipbuilding Division on April 6th.

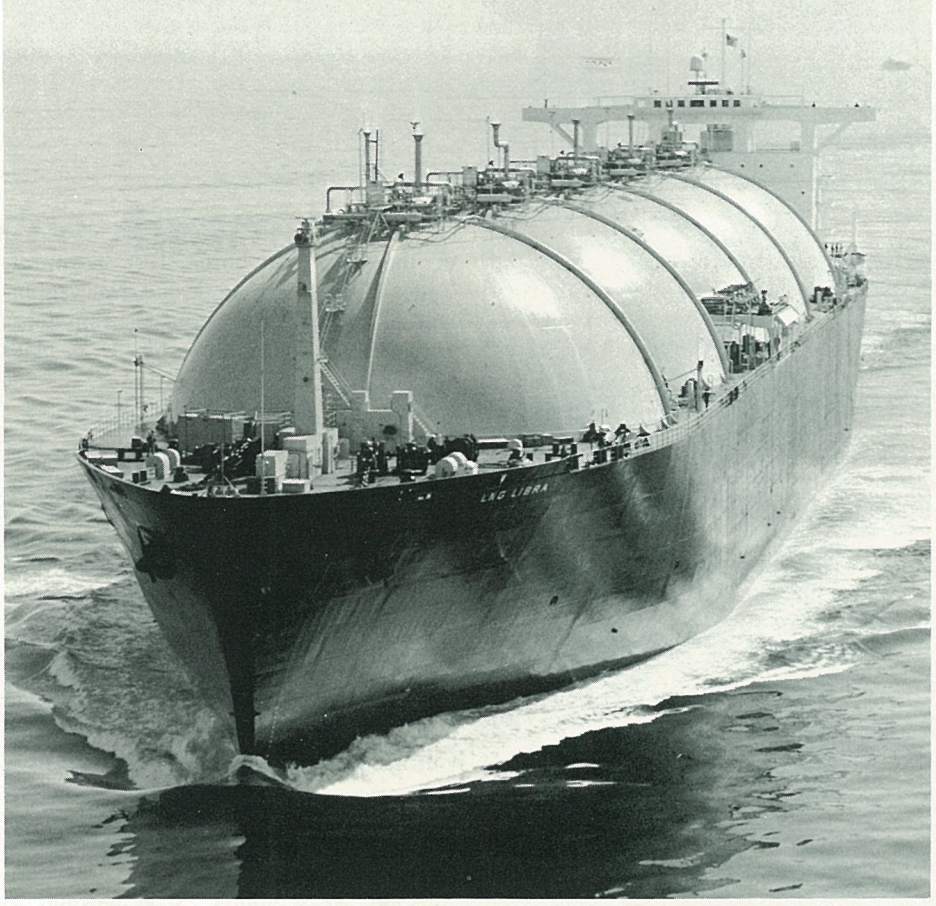
The huge tanker was officially named by Mrs. Roesmin Nurjadin, wife of Air Chief Marshal Roesmin Nurjadin, the former Indonesian Ambassador to the United States and currently Minister of Transport, Communications and Tourism for the Republic of Indonesia.

LNG Libra is Quincy's sixth LNG tanker. The 636-foot long, 95,000-ton ship is capable of transporting 125,000 cubic meters of natural gas cooled to a liquid at 265 degrees below zero. Later this spring, the ship will join five sister ships which are currently delivering LNG from Indonesia to Japan under a major international project involving four countries — Indonesia, Japan, the United Kingdom and the United States.

Speaking at the naming ceremony, the Minister said the delivery of *LNG Libra* constitutes a significant milestone in the economic development of Indonesia.

"In addition, it is another example of the international cooperation that has been the backdrop of this project from the beginning," he said.

So far, the five Quincy-built tankers which have been delivered previously have transported 11.7 million cubic meters of LNG to Japan since beginning service in August 1977. All of the ships fly the American flag and are manned by American crews.



LNG Libra During Sea Trials

Tomahawk Test Demonstrates Antiship Mission

A U.S. Navy Tomahawk Cruise Missile was successfully launched April 13th from a ground platform at the Pacific Missile Test Center, Pt. Mugu, Calif. The missile flew a long-range guidance development test flight against target ships off the coast of southern California.

All major objectives were met in the launch and flight, including ignition of the Tomahawk's solid-propellant booster and transition to cruise flight using the missile's turbofan sustainer engine. This marked the first flight of a Tomahawk using a production version of the turbofan engine built by Williams Research Corp.

The successful launch from a canister accomplished a portion of the test requirements for both the Navy's Sea Launched Cruise Missile and the Air Force's Ground Launched Cruise Missile.

The Tomahawk used its anti-ship guidance set to find the targets and execute several simulated attacks. It then flew to San Clemente Island where it was recovered for future use in the Tomahawk flight test program.

The flight test was the 40th for the General Dynamics-built Tomahawk which is being developed by the Joint Cruise Missile Project Office. Tomahawk missiles, designed for both land and ship attack missions, have had 35 hours of test flight and have been launched from aircraft, submarines and ground platforms.

'Documentary' on F-16 Criticized as "Slanted and Inaccurate"

Editor's Note: Many General Dynamics employees have probably seen a recent television program on the F-16 which is being aired by the Public Broadcasting Service. The article that follows is a summation of the reactions to the broadcast in the United States and Europe.

A one-hour television production "F-16: Sale of the Century" has been shown over a period of weeks beginning March 11th in West Germany, Great Britain, Belgium, Denmark, the Netherlands and Norway and over many Public Broadcasting Service (PBS) stations in the United States.

The 'documentary,' produced by Granada Television of Great Britain, has been denounced by government and military officials in the United States and in Europe.

"Given the F-16 program's significant, positive accomplishments to date, the Granada production is not only misrepresentative, it is unfair," the U.S. departments of State and Defense said in a joint message which was sent to the embassies in Belgium, Denmark, the Netherlands and Norway, all members of the European Participating Governments (EPGs) on the F-16 program.

U.S. Air Force Maj. Gen. James A. Abrahamson, Director of the F-16 System Program Office, attended a screening of the program with military representatives of the EPGs who were stationed at the Wright-Patterson AFB in Ohio.

"badly distorted . . . a deliberate lie"

Following the screening, Gen. Abrahamson told newsmen that it was filled with "inaccuracies and omissions," and said that it was "badly distorted . . . a deliberate lie."

The European representatives made similar comments.

At issue were the five basic contentions of the program. Those were: that the $6.09 million "not to exceed" price of each EPG F-16 would be exceeded, that an agreement on a 58 percent offset level for the four countries would not be met, that a promised "fortune in sales" of F-16s to other countries would not occur, that EPG industries were not receiving the technology transfer they had been promised and that it was "doubtful" the F-16 was the right plane for Europe.

"The Granada production is slanted and inaccurate," the joint message of the U.S. departments of State and Defense responded. "Statements of interviewees have been edited to such an extent that they become incorrect and misleading."

On price, for example, the message noted that the $6.09 million "not to exceed" price had been "expressed in fiscal year 1975 terms" and that "even with the enhancements that have been incorporated into the F-16, this goal has not been breached and is still valid" taking into account the inflation that has occurred since 1975.

The State and Defense Department message also said the "58 percent commitment can and will be met," and that "the documentary film also distorts facts relative to technology transfer." The message explained that it was recognized from the outset "that technology transfer would accrue more to Denmark and Norway, which did not have well-established aerospace industries, than to Belgium and the Netherlands, which possessed a mature industrial base" and in turn receive a heavier share of offset production.

In response to charges that the F-16's Pratt & Whitney F100 engine is defective, the message said:

"The U.S. Air Force carefully details and examines all potential F-16 problems, no matter how minor they may be. Consequently, the F-16's F100 engine has come under extremely close scrutiny, but this action should not be taken to imply that the engine is unsatisfactory.

"Rather this is a routine procedure, common to all weapon systems acquisition efforts, not just to the F-16, and is considered a necessary step to ensure aggressive before-the-fact corrective action for elements that might otherwise affect the systems, survivability, operability, maintainability and reliability.

"Thus while the USAF has given top priority to a potential F100 engine stall stagnation problem, Granada Films has misrepresented the issue. The F100 engine has accrued over 400,000 total operating hours. This represents an engine maturity level higher than that ever experienced by a single engine jet fighter."

The U.S. Government's statement was widely distributed to the news media in Belgium which led to a number of newspaper articles which quoted the response as well as a televised response immediately following the broadcast.

In the Netherlands, the Ministry of Defense assailed the broadcast's allega-

"anger is quite justified"

tions in statements to the news media and in a 13-point response to questions raised by a member of the Dutch Parliament.

Lt. Col. Ari P. De Jong, Chief of Information for the Royal Netherlands Air Force, said the program was "such a lie as far as the main arguments are concerned that anger is quite justified."

An analysis in a Belgian newspaper, *Het Laatste Nieuws*, said the televised claim that foreign sales goals would not be met discounted the fact that Spain, Canada and Australia are all considering the F-16 as a finalist in competitions, and that "the F-16 might at the right time replace the 20-year-old F-5 as the standard plane which is being delivered by the U.S. to friendly countries."

As for whether the F-16 was the right choice for Europe, the article noted that the F-16 "was the product of an entire new generation" that stood "far above" the other aircraft that were in competition for European government acceptance at that time.

"Although military people and technicians settled long ago on technical grounds the competition between the Mirage and the American F-16, non-technical Europeans are once more stirring up trouble with emotional arguments," the analysis added.

F-16s Conduct Operational Test North of Arctic Circle

The F-16's ability to perform in severe winter weather conditions was demonstrated convincingly during five frigid weeks of operational testing north of the Arctic Circle in Norway.

Four U.S. Air Force F-16s from Edwards AFB, Calif., carried out the operational testing in February and March at Bodo Air Station of the Royal Norwegian Air Force (RNAF).

Brig. Gen. Eyvind Schibbye, Bodo Station Commander, said the tests in various weather extremes proved that the multirole fighter "will meet expectations."

The general said he was particularly impressed with the F-16's ability to operate from icy runways when equipped with a drag chute—a parachute that is deployed for braking when landing—which will be standard equipment on the 72 F-16s which Norway has ordered.

The drag chute tests were carried out using one of the aircraft over a two-week period while the other three were tested for evaluation of operability and maintainability in the European flight environment.

Gen. Schibbye said the RNAF was impressed with the confidence the U.S. Air Force and General Dynamics displayed in deploying the F-16s for tests only two years after rolling out the first Full Scale Development aircraft.

An F-16 at Bodo, Norway

"The aircraft were tested under all the weather conditions that north Norway can provide during the winter season," said Lt. Col. Tuck McAtee, Chief of the U.S. Air Force Test Team at Bodo. Pilots from both the Norwegian and U.S. air forces flew test missions with support provided by U.S. Air Force and Fort Worth personnel.

The adverse weather conditions included rain, snow and high winds. On several occasions, the F-16s flew while Norwegian military aircraft remained on the ground because they had lacked sufficient range to divert to alternate fields if that became necessary.

Commenting on an issue which is of major interest in Norway, Schibbye said that preliminary measurements indicated that the noise level of the F-16 both on takeoff and landing is much more conducive to good-neighbor relations than the F-104s which they will be replacing.

The operational testing also drew praise from the Defense Committee of the Storting, Norway's parliament, whose members visited Bodo during the evaluation. Per A. Utsi, Vice Chairman of the Committee, said his group was pleased to find that the F-16 "seems to meet the expected perfection."

"For the first time, we will procure a fighter plane already at the production stage which will meet special Norwegian demands," Mr. Utsi said. "I am first of all thinking of the aircraft's ability to operate from icy runways and its range."

Utsi also observed that the F-16 coproduction program had given industry in Norway contracts "of great interest and rich perspectives." He said this occurred "at a time when large parts of our industry were hungry for contracts to secure work for their employees."

"I am fully satisfied with the experience we have gained so far during the F-16 program," he said, "even though there are still some coproduction matters to be ironed out."

Commenting on the F-16 during a local television interview, Schibbye said, "If we had to decide on an aircraft today, it would still be the F-16, even though now there are other candidates to choose among."

Savings and Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of February were:

Salaried:	
Government Bonds	$ 2.1107
Diversified Portfolio	$ 1.2943
Hourly:	
Government Bonds	$ 2.1102
Diversified Portfolio	$ 1.3235
General Dynamics Stock	$30.25

General Lauds Zero Defect F-16 Delivery

Fort Worth Division has been complimented on the quality of its F-16 craftsmanship.

The compliment was made in a letter attesting to Fort Worth's performance in delivering a trouble-free F-16 to Hill AFB. The letter from Maj. Gen. James A. Abrahamson, Director of the F-16 System Program Office, was sent to Herbert F. Rogers, Fort Worth Vice President and F-16 Program Director.

In the letter, the general said, "I was very pleased to learn that F-16 number A-10 was delivered to the 388th TFW at Hill AFB with no discrepancies reported. While I expect General Dynamics to produce every F-16 with zero defects, I realize this is a lofty goal. We must continue to strive together to reach that goal.

"Because we have reached this very significant milestone, I am taking this opportunity to congratulate you, Herb, and all the people at General Dynamics who are working very hard to produce high quality F-16s. Let your superior past performance be the encouragement you need to make every F-16 as perfect as possible . . . I realize superior products are the result of total team effort and would ask that you convey my most sincere appreciation to your entire team."

An Artist's Concept of a KC-10A Refueling F-16s

Convair Selected to Build KC-10A Fuselage Sections

Convair Division has been selected by McDonnell Douglas Corp. to make fuselage sections for the U.S. Air Force KC-10A Advanced Tanker Cargo Aircraft.

An initial $18 million contract was awarded to cover nonrecurring costs, including design and development.

Convair produces fuselage sections for the McDonnell Douglas DC-10 wide-bodied jet aircraft, of which the KC-10A is a military derivative.

The KC-10A fuselage sections will be similar to those of the commercial jetliner, except for the requirements for fuel tanks, aerial refueling systems and cargo carrying equipment.

First deliveries of the KC-10A sections are scheduled for later this year.

The mobility of the U.S. armed forces will be increased by the ability of the KC-10A to refuel fighter and transport aircraft while simultaneously carrying support equipment on overseas deployments. In most cases, the KC-10A will be capable of conducting the deployments without having to land anywhere outside the continental United States and without depleting critical fuel supplies in theaters of operation.

Fort Worth Doing Its Share To Cut Energy Consumption

A British thermal unit (BTU) is the amount of energy required to heat one pound of water one degree Fahrenheit. Each year, approximately 127 million BTUs are needed to heat, cool and light the average home.

But at Fort Worth Division, the amount of electricity, gas, oil and steam used in operating the facilities last year added up to 1.784 trillion BTUs—an amount that is being reduced each month because of conservation.

"Rising energy costs have made it imperative that we conserve energy," said J. E. McMichael, Manager of Facilities Engineering at the division. "We've been putting years of effort into developing methods that will cut back on the amount of power used in Fort Worth's 6.5 million square feet of facilities."

"The greatest savings in dollars and energy we've made so far is by replacing steam with electricity in the cooling system," he said.

Until recently, steam was used to power chillers which cool the plant—overheated by sunlight, artificial light, heat produced by massive pieces of manufacturing equipment and the body heat generated by about 13,000 employees.

"Now we're saving 186 billion BTUs a year with the four electrical units presently in operation, and four additional units are being installed," said Mr. McMichael.

Since 1972, when the division employed roughly the same number of persons as today, conservation methods such as replacing steam with electricity have not only reduced overall energy use by billions of BTUs a year, they have trimmed energy costs per employee by 34 percent.

Fort Worth uses a computer process called BLAST (Building Loads and System Thermodynamics) to evaluate conservation proposals submitted each year.

One of the most successful BLAST-evaluated projects resulted when approximately half the lighting fixtures in the main office building were removed and the remainder replaced with 35-watt "saver" fluorescent tubes instead of the previous 40-watt tubes. That action saves Fort Worth about 60 percent in electricity for lighting each year.

Some of the most recent research in the BLAST program has been on the utilization of solar energy. Despite its seemingly unlimited power, McMichael said large industrial firms are having difficulty discovering financially sound methods of harnessing solar energy.

"No one has yet come up with a really cost effective way for solar heat to actually replace other energy sources," he explains. "The best utilization of solar energy we have found is in augmenting present sources, such as electricity, gas or coal, with solar panels.

"I think it can be said, however, that more and more solar energy will be used as the price of other resources increases," he continued, "and more ways to conserve energy will be discovered in the future."

"Just take Fort Worth as an example," said McMichael. "Because of new conservation ideas and methods, we've already exceeded the objectives we set three years ago for 1980."

Convair Group Leader Wins $1,388 For 'Simple Solution'

Jim Brown has watched Convair's demand for printing services soar, the supply of paper dwindle and the price of paper increase in the Graphic Reproduction department, where he started 19 years ago as binding machine operator.

So recently, Mr. Brown, now a group leader in Graphic Reproduction, suggested a solution to rising costs—and was awarded a check for $1,388.

"It was really a very simple solution to an ever-growing problem," Brown said in describing his idea which should save Convair more than $13,000 this year."We were getting one kind of paper from one company and two other types of paper from another source and paying steep rates based on the amount we bought.

"I suggested we get all our paper from one place, increasing our volume from that source and getting a better price. It's also going to solve some of our storage and handling problems," he said.

By submitting the suggestion, Brown was able to save the company 67 cents a ream on one weight of paper alone. With 50 million sheets of paper going through the presses a year, savings are considerable.

"Brown's suggestion is fairly typical of a number of the suggestions we receive each year," said Jake Ibarra, who heads up Convair's Employee Suggestion program. "We calculate that more than half a million dollars was saved last year, and most of the ideas are not too complex."

More than $50,000 was handed out to 2,728 suggesters last year, making an average award rate of $74.85 per person.

"Not all of the suggestions result in awards, of course," Mr. Ibarra pointed out. "We have an adoption rate of just about one in three, and that's pretty good."

Convair Service Awards

40 Years

Operations: E. L. Williams, E. F. Gurling.

35 Years

Operations: F. Washburn, R. C. Emerson, M. F. Gonzales, E. B. Tutterrow, A. L. Fuller.

Finance: D. E. Rheaume.

Quality Assurance: C. A. Keeth.

Research and Engineering: J. A. Howland Jr.

Industrial Relations: R. B. Purdy.

Launch Vehicle Programs: L. M. Barnes.

30 Years

Operations: W. M. Warren, E. J. McInvale, C. Lent.

Finance: D. S. Passenheim.

Data Systems Services: J. P. James.

25 Years

Operations: R. J. Franklin, J. W. Hyland, J. H. Jordan, R. Rogel, B. G. Bourguignon, A. Lucero, P. E. See, W. J. Waller, I. P. Mouet, J. W. Bradley, C. H. Gladding, P. M. Julian, W. E. Essington, A. Gamboa, H. Morrow, P. House.

Quality Assurance: R. H. Poulsen.

Research and Engineering: P. A. Johnson, R. W. Stoker, R. N. Myers, N. A. Bodwell, N. P. Young, P. A. Bergin, R. L. Ortega.

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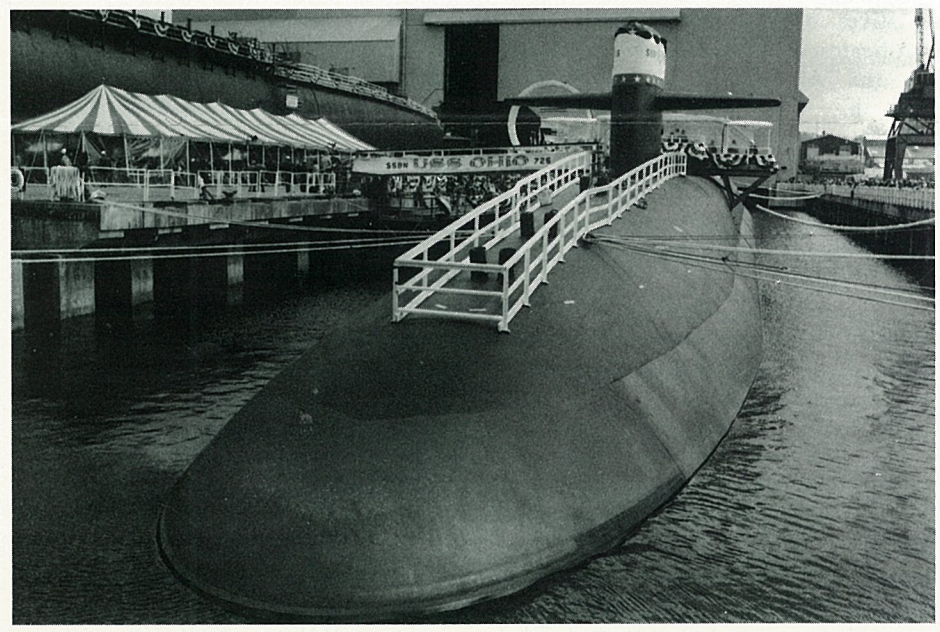
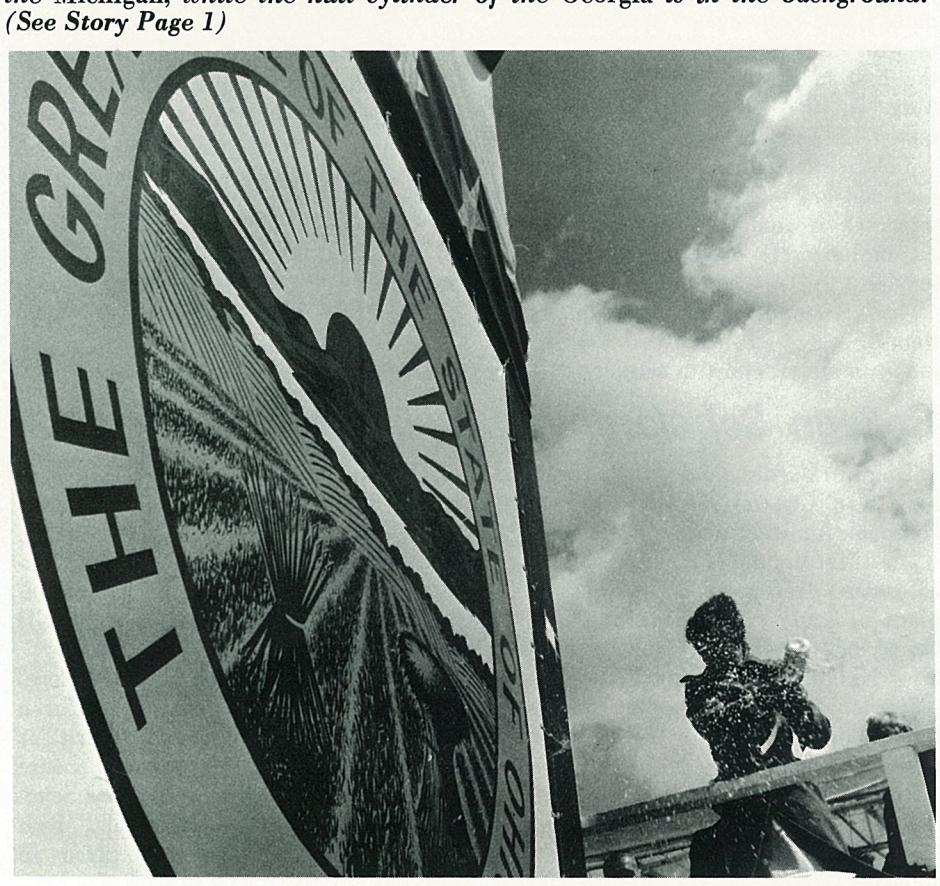


Waiting for Christening. *The* Ohio, *America's first Trident missile submarine, floats in the graving dock at Electric Boat's Land Level Submarine Construction Facility during her christening ceremony April 7th. At left is the* Michigan, *while the hull cylinder of the* Georgia *is in the background.* *(See Story Page 1)*



Big Splash. *Champagne splashes as Mrs. Annie Glenn christens the* Ohio.

Weld Completed. *Mrs. Rosalynn Carter (left) wife of President Carter, smiles after welding her initials — R.S.C. — into the keel of the* Georgia *(SSBN729) assisted by Kimberly Shriver, a first class welder at EB. (See Story Page 1)*

Happy Sponsor. *Mrs. Annie Glenn and Senator John H. Glenn pose for photographers moments after Mrs. Glenn had christened the* Ohio *(SSBN 726) at Electric Boat Division April 7th. (See Story Page 1)*

Defense Agency Thanks Convair For Quick Support in Emergency

Air Force Lt. Gen. Gerald Post, Director of the Defense Logistics Agency, recently presented Dr. L. F. Buchanan, Convair General Manager, and representatives of two subcontractors with Certificates of Appreciation for assisting the Air Force in an unusual situation.

During brief ceremonies at Kearny Mesa last month, Air Force Lt. Col. Richard Seeley of the Defense Contract Administration Services Office at Convair, related the story that prompted the agency's awards:

"Early in February, the Director of Logistics for the Air Defense Command requested our assistance in resolving a critical support problem," he said. "Several F-106 Delta Dart interceptor aircraft had become incapable of performing their missions because of the lack of a crucial wiring harness, and more aircraft were expected to be removed from operational status each week until replacement harnesses could be delivered."

"Needless to say," he continued, "this would have a serious impact on the Air Force's ability to meet its operational commitments. The Air Defense Command knew Convair had been contracted to provide replacement harnesses, with the first to be delivered at the end of May. By that time, however, an estimated 23 aircraft would be grounded."

Col. Seeley explained that at the scheduled delivery rate of three new harnesses per week, it would be late August before all the aircraft could be returned to service.

"In view of the urgency of the situation," Seeley said, "I asked Convair to make an all-out effort to accelerate delivery. The seriousness of the problem was immediately understood, and Convair went into action."

Convair's two suppliers in the production of the wiring harnesses, ITT Cannon Electric and Cicoil Corp., were asked to join in an all-out effort to beat the scheduled delivery dates.

Cannon had to modify existing tooling, work overtime on fabrication and do all final assembly of the connectors in its own facility. It finished the task in one week — the normal lead time is 20-22 weeks.

"The electrical connectors were hand-carried to Cicoil, a small, minority-owned business specializing in the design and manufacture of harness assemblies," Seeley pointed out. "Some of its personnel worked 12 to 14 hour shifts, seven days a week."

The first harness was delivered to the Air Force February 19th, just over two weeks after the requirement was established.

The combined efforts of Convair, Cannon and Cicoil resulted in the first harness being delivered 100 days early, and the rate of production almost tripled.

"Congratulations on a job well done," Seeley concluded, "and thank you for sharing the urgency of the situation with the Air Force."

In making the presentations, Gen. Post echoed Seeley's appreciation, adding, "Quite often people have criticized the military/industrial complex, but this is yet another example of how private industry and the military can work together as a team . . . and I'm proud to have been a member of that team."

College Scholarships Awarded to Students

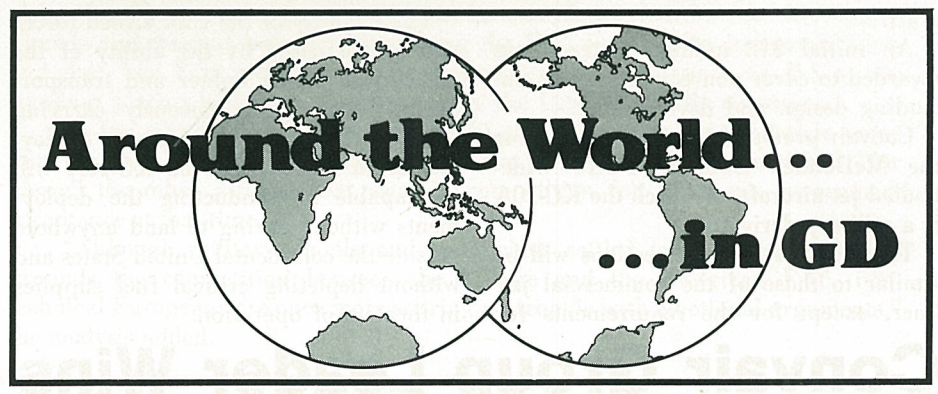
Diedre Hardin and Kim Hubbard have won General Dynamics-sponsored National Achievement Scholarships.

Miss Hardin, daughter of Van Hardin, a design drafter at Convair Division, plans to study engineering at the University of Notre Dame, South Bend, Ind. Miss Hubbard, a resident of St. Louis, plans to attend Washington University in St. Louis to prepare for a career in chemical engineering.

Under the National Achievement Scholarship Program, GD awards two four-year college scholarships to outstanding black students who are children of GD employees or live in the area of a GD facility and plan to major in engineering or business administration.

Each year, GD also awards four National Merit Scholarships to outstanding students who are children of GD employees.

Parents of high school sophomores who are interested in competing for a General Dynamics National Merit or Achievement Scholarship should ensure the students take the Preliminary Scholastic Aptitude Test/National Merit Scholarship Qualifying test given in October.



At CHQ: *Edward W. Shepherd* transferred from Electric Boat as Corporate Manager of Administrative Services . . . *Tommye M. Rogers* was promoted to Benefit Accounting Representative . . . *Terry A. Straeter* joined as Director - Technical Software - DSS . . . *Richard L. Corbin* was promoted to Corporate Director - Aerospace Financial Planning . . . *Carl G. Miller* was promoted to Corporate Director - Commercial Financial Planning . . . *Eric N. Bundy* joined as Senior Auditor . . . *William R. Burchell* joined as Internal Auditor.

At Convair: *Harry O. Eastman* and *Martin Winkler* were promoted to Engineering Manager . . . *Gerald H. Owen* and *William L. Weston* were promoted to Engineering Chief.

At Fort Worth: *John E. Gulley* was promoted to Engineering Manager . . . *William O. Lee* was promoted to Group Engineer . . . *Burton E. Lambert* was promoted to Manager of Employee Relations . . . *George E. Nolet* transferred from St. Louis as Project Industrial Engineer . . . *Richard L. Fagan* was rehired as Manager, F-16 Support Production.

At Pomona: *Nicholas M. Baker* joined as Assistant Director International Marketing . . . *Joe T. Gutierrez* was promoted to Section Head . . . *Charles E. Seeger* joined as Director of Quality Assurance . . . *Victor G. Warriner* joined as Senior Project Engineer . . . *Damian L. Hall* was promoted to Assistant Program Director.

At EB: *Craig L. Haines Jr.* was promoted to Director of Procurement.

At Quonset Point: *Donald K. Reil* was promoted to Special Assistant to General Manager.

At Electronics: *Joe E. Alcala* transferred from Pomona as Engineering Manager . . . *Emery M. Balog* transferred from Pomona as Director of F-16 AIS Product Line Management . . . *Ray V. Lubeck* transferred from Pomona as Director of Proposal Development & Sales Promotion.

At Material Service: *Arthur Tyrrell* joined as Director of Community Relations . . . *Michael Mago* was promoted to Sales Manager.

At GDCC: *L. Wayne McCollum* was promoted to Manager, Product Marketing Programs . . . *Raymond St. Pierre* was promoted to Product Marketing Manager . . . *Peter J. Russo* was promoted to Operating Manager of the New York District . . . *John J. Sailors* joined as Branch Manager in Los Angeles . . . *Larry L. Jones* was promoted to Operations Manager in Los Angeles . . . *Harold Russell, John E. McGowan* and *John E. Lee* joined as Systems Consultants in Los Angeles . . . *William H. McCarty* and *John D. VerMuelen* were promoted to Regional Manager.

At Stromberg-Carlson: *Dennis H. McVey* was promoted to Customer Service Engineer - West Coast Regional Service Office . . . *Donald R. Merriam* was promoted to Manager, Analog Engineering . . . *Lee E. Webb* was promoted to Area Supervisor - Midwest Regional Service Office . . . *George M. Dellinger* joined as Manager, Market Planning.

At Asbestos: *Jean Gaudry* was promoted to General Sales Manager and Director of Marketing.

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Pomona Receives $95 Million Contract For RAM System

The U.S. Navy has awarded a $95 million contract to Pomona Division for full-scale engineering development of the RAM guided missile weapon system.

The contract was awarded to Pomona by the Naval Sea Systems Command following the signing of a Memorandum of Understanding by the governments of the United States, the Federal Republic of Germany and Denmark. The three countries will jointly sponsor development of the shipboard missile system, which will provide a low-cost, high-firepower capability for defense against enemy antiship missiles. In addition, Belgium, the Netherlands and Norway have been granted 'official observer' status for the program.

RAM will use a guidance system which will home on radar and infrared emissions from enemy missiles. Testing of RAM prototypes at White Sands Missile Range in New Mexico has demonstrated that the design is ready to proceed into engineering development and testing.

"A key element of the RAM system is its adaptability," said F. M. Stephens, RAM Program Director at Pomona. "It can be used effectively on the smallest patrol boat or the largest carrier."

"The RAM makes use of existing hardware to minimize costs of the system," he says. "For example, the Stinger infrared seeker and the Sidewinder rocket motor, fuze and warhead are used, and the system is designed to use a ship's existing radar and electronic sensors for initial target detection."

Two launching systems will be capable of firing the RAM. A launcher to be developed by Pomona under the present contract will hold and fire 24 missiles; the launcher's design is based on Pomona's Phalanx weapon system. The Pomona-built launcher will share many components with the Phalanx.

A second launcher configuration will be an adaption of the NATO Sea Sparrow Surface Missile System which is now in the navies of nine countries. This configuration will be developed under a separate contract.

Full-scale engineering development for RAM will extend over a 50-month period and will include fabrication of prototype command and control systems, engineering model missiles and limited production of missile rounds for flight test and evaluation.

Donations to Colleges Totaled $163,876

General Dynamics' employees contributed $81,938 to colleges and universities of their choice last year, and each contribution was matched dollar for dollar by the company under the Matching Gifts Program.

In the first quarter of 1979, employees' contributions to institutions of higher learning were $36,298.

Since the Matching Gifts Program was begun in 1975, General Dynamics and its employees have donated $587,000 to schools around the U.S.

Under the program, the company will match an employee's contribution of cash or securities to an approved institution from a minimum of $25 up to a maximum of $2,000.

Qualifying institutions must be listed in the latest edition of the U.S. Department of Health, Education and Welfare's "Higher Education Directory," be accredited by one of six regional associations and be approved to confer bachelor's or advanced degrees.

Questions regarding the Matching Gifts Program should be addressed to the Industrial Relations department of each division.

Fokker-Assembled F-16s Delivered

The F-16 Multirole Fighter entered service with the Royal Netherlands Air Force (RNLAF) on June 6 with the ahead-of-schedule delivery of the first two Dutch-assembled aircraft at the Fokker-VFW plant near Amsterdam.

At the ceremonies which marked the acceptance of the initial aircraft for the Netherlands—the third North Atlantic Treaty Organization (NATO) nation to fly the F-16—Defense Minister Willem Scholten said his country is "convinced that the F-16 was and still is the best choice to accomplish the mission allocated to our Air Force in the allied defense."

U.S. Ambassador to the Netherlands Geri M. Joseph hailed the event as symbolic of "something . . . rare among industries and nations—cooperation."

About 500 European and American governmental and industry officials and other invited guests, plus an equal number of Fokker-VFW personnel, attended the ceremony in the final assembly building of the plant. They had expected to witness turnover of the first of 102 F-16s on order by the RNLAF.

However, Frans Swarttouw, the Chairman of Fokker-VFW, announced that his assembly line had not only beaten by three weeks the schedule for delivery of the first plane, a twin seat F-16B, but also was delivering the second F-16, a single seat F-16A, almost two months early.

The delivery timetable was established in June 1975, when the Netherlands, Belgium, Denmark and Norway selected the low-cost, high-performance F-16 to replace aircraft in their aging fighter fleets and agreed to a coproduction program involving industries in the four countries and the United States. The European selection followed the selection of the F-16 by the U.S. Air Force in January 1975.

Turnover of the aircraft in the Netherlands followed by six months the delivery of Belgium's first F-16 last January 26 and the USAF's first operational F-16 to Hill AFB, Utah, on January 6.

Since then, 18 more of the versatile fighters have been delivered to the U.S. Air Force and five are now being flown by the Belgian Air Force.

Sixty-eight F-16s are now in various stages of assembly at Fort Worth and on the two European assembly lines at Fokker-VFW and at SABCA/SONACA in Belgium, with a total of 90 scheduled for delivery during 1979. Fokker-VFW is assembling the 102 aircraft for the Netherlands and 72 for Norway. At the Belgian facilities, 116 F-16s are being assembled for that country's air force, along with 58 more for Denmark. Norway and Denmark will receive their first aircraft in early 1980.

Dutch Delivery. *The first Dutch-assembled F16 was delivered to the Royal Netherlands Air Force on June 6 in ceremonies at Fokker-VFW plant near Amsterdam. A surprise during the ceremony was the announcement that two F-16s were being delivered, not just one.*

David S. Lewis, Chairman and Chief Executive Officer of General Dynamics, expressed "the greatest regard and admiration" for the European subcontractors taking part in the program. Like Mr. Swarttouw, he voiced "great hopes that this program will last long beyond the present time," and he cited the two-plane delivery as "proof that a joint multinational project can be done . . . on time, on schedule and within cost."

Mr. Scholten noted that the program not only follows the predetermined schedule set in 1975, but also that "costs and prices are well within hand, not in the least thanks to successfully maintaining an almost competely identical configuration of the aircraft for the five participating countries."

"The program for the first slice of 998 aircraft has already led to orders in the Netherlands' industry valued at more than one billion guilders and al-

Continued on Page 4

Convair's Team Prepares For Cruise Missile Flyoff

Preparations for the flyoff between Convair's air launched cruise missile (ALCM) and a cruise missile being developed by Boeing are reaching their peak at Edwards AFB, Calif., according to Clay Dennis, the Convair Base Manager at the California test center.

Mr. Dennis said that a team of 90 Convair employees are now located at Edwards focusing on the competitive flyoff between Convair's AGM-109 and Boeing's AGM-86B, which is scheduled to begin in June.

According to the Department of Defense, the flyoff will be a major factor in determining which of the two missiles will be selected to continue into full-scale development and production. In the flyoff competition, the two missiles will each make 10 flights. The missiles will be launched from B-52 carrier aircraft specially modified for the flight test program and will be evaluated on their capability to carry out a variety of missions under very stringent test conditions.

"The general requirements of the ALCM competition demand operationally realistic mission scenarios that mean planning long-range missions following over-the-water launch with enroute terrain following navigation over land areas," Dennis said.

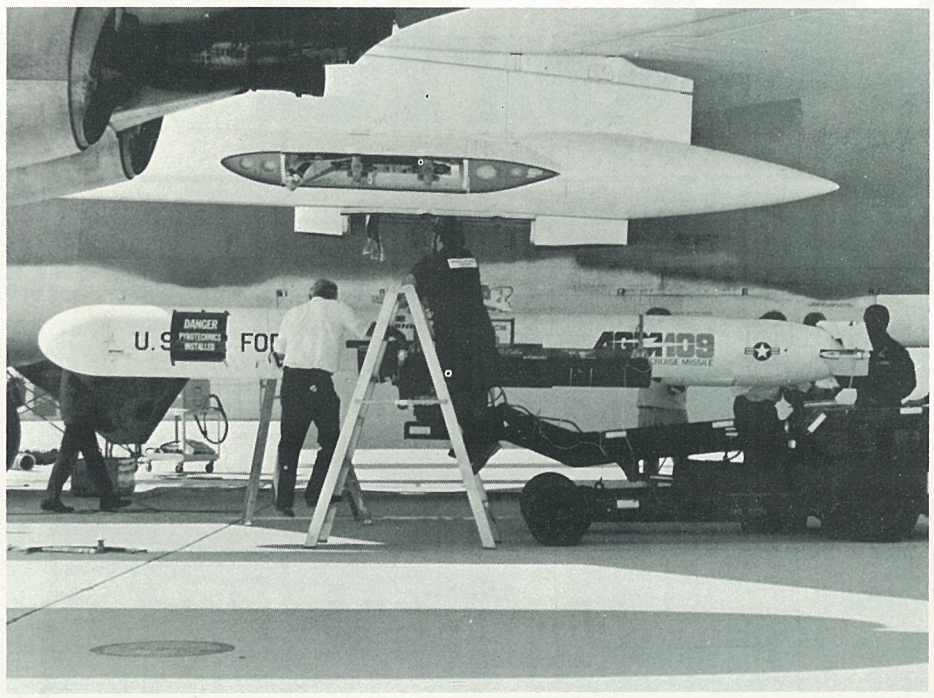
"All of the information obtained during the competition will be entered into the overall ALCM data base and can be used as necessary in either the source selection process or the production authorization process," he said.

"Support aircraft will be used in each of the free-flight tests to assure positive command and control and to provide aerial recovery of the missiles at the end of each mission," he continued.

The results of mission performance, ground tests and evaluation of support equipment will all be used in the final selection process. After an analysis of the results is made, the Air Force will select a winner early next year.

See Photo Page 2

Keel Laid. *Dwight H. Seely Jr. (center), Chairman of Trunkline LNG Co., a subsidiary of Panhandle Eastern Pipe Line Co., brushes off his welded initials in the keel of* Louisiana, *Quincy Shipbuilding Division's 10th liquefied natural gas tanker. Mr. Seely was assisted in the weld by Larry St. John (right), a first class welder, while Capt. Jan A. A. van Lier, President of Moore-McCormack Bulk Transport Inc., observed. When completed, the tanker will be jointly owned and operated by a partnership of subsidiaries of Panhandle Eastern, Moore-McCormack and General Dynamics.*



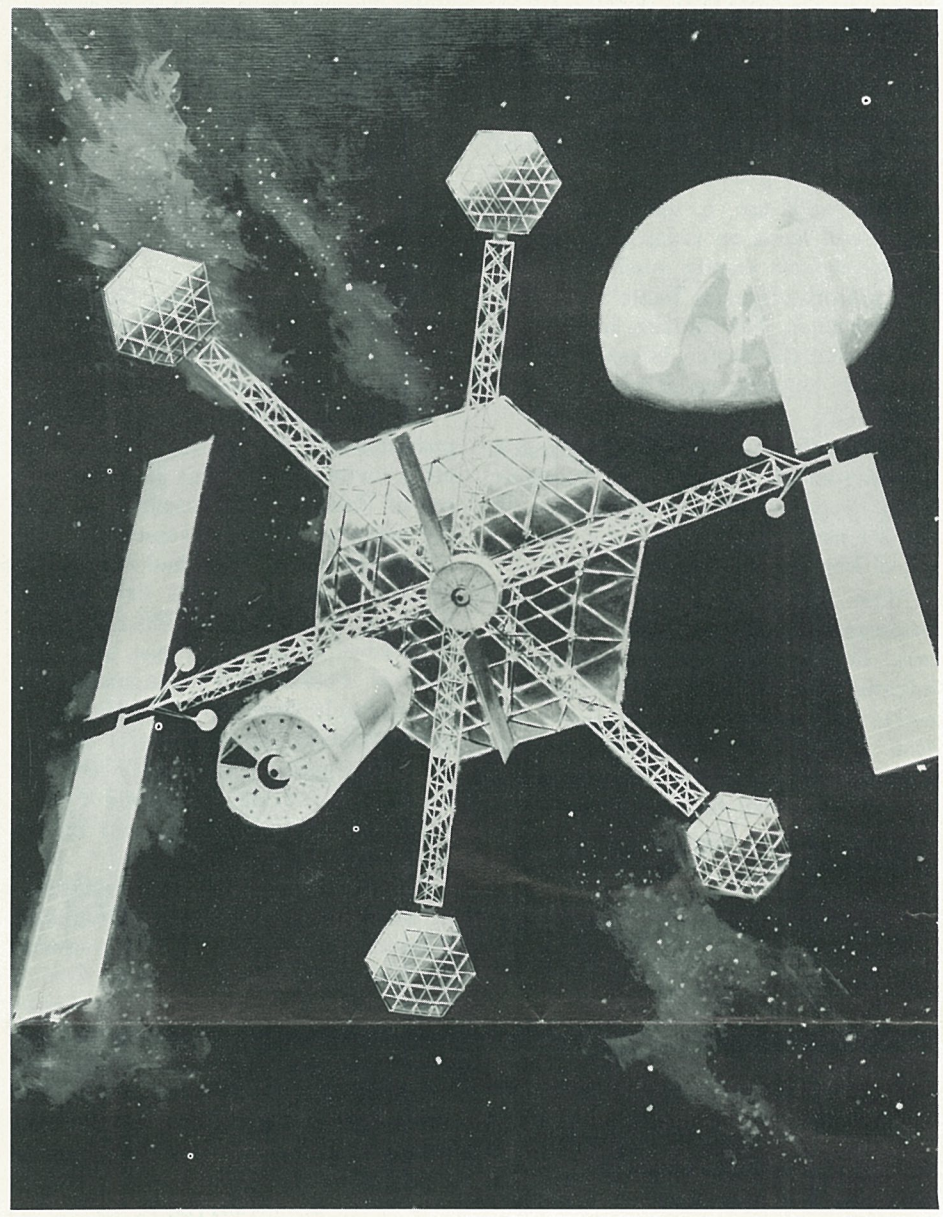
Getting Ready. *ALCM-1, Convair's first entry in the U.S. Air Force's air launched cruise missile competition, is positioned on a pylon of a B-52 carrier aircraft at Edwards AFB, Calif.(See Story Page 1).*

Convair Receives Contract For NASA Satellite Study

Convair received a $250,000 contract from the National Aeronautics and Space Administration to study the concept of a Geostationary Platform System, a large orbiting communications satellite positioned so that it appears fixed at a single point above the surface of the earth.

Convair's Advanced Space Program team, headed by Dr. Robert Bowman, will define the requirements for the system which would provide power generation and data handling and storage as well as a wide range of communications between stations on earth.

The platform would use existing microwave facilities to transmit and receive information. Planners believe that by 1990, a group of platforms orbiting over the Americas, Europe and the Far East could handle scientific data and commercial communications such as television, telephone and radio at substantially lower cost than is now possible.



Concept by Roy Gjertson

System Study. *This artist's concept shows what a Geostationary Platform System could look like if placed into orbit to handle communications. Convair was recently awarded a contract to study the requirements for the system.*

Aviation Week Writer Flies F-16 for Evaluation Report

Preflight Inspection. *Robert R. Ropelewski, Los Angeles Bureau Chief for* Aviation Week & Space Technology, *and Neil R. Anderson, GD's Director of Flight Test, make a preflight inspection prior to an evaluation flight of the F-16.*

Robert R. Ropelewski, the Los Angeles Bureau Chief for *Aviation Week & Space Technology*, recently flew an evaluation mission in the F-16. He was the first pilot who was not a government official or a military or test pilot to do so.

Mr. Ropelewski, a former Marine aviator who has flown numerous high-performance aircraft, made the flight in order to write a 'Pilot Report' on the F-16 as part of his magazine's coverage of new aircraft. His five-page, illustrated article appeared in the May 28 issue of *Aviation Week.*

Ropelewski made the flight in a two-seat F-16B at Fort Worth with Neil Anderson, GD's Director of Flight Test.

The flight, which covered nearly one and a half hours, was made over north Texas and included aerial maneuvering, simulated intercepts of high- and low-flying aircraft, and air-to-ground attacks. The aircraft attained a speed of Mach 1.3 and pulled more than eight g's, or eight times the force of gravity.

Shortly after takeoff, Ropelewski took over the controls of the F-16 from the back seat and flew the majority of the mission. He indicated he was impressed with the cockpit layout, the visibility afforded the pilot by the F-16's canopy and the flight controls.

"Primary difference from other aircraft is the side-stick controller on the right console, replacing the center-mounted control stick found on most aircraft," he wrote. ". . . It takes only a few moments to become accustomed to the position of the stick and to the fact that it is force sensing and does not move."

In the evaluation flight, Ropelewski used the F-16's radar and head-up display in the practice engagements with other aircraft.

According to the *Aviation Week* writer, "U.S. and European air force pilots currently transitioning into the F-16 from such aircraft as the McDonnell Douglas F-4 have been impressed by the performance of the new aircraft, describing the transition as analogous to the change from propeller-driven to turbojet fighters in the late 1940s and early 1950s."

In the article, Ropelewski wrote that "high thrust, excellent maneuverability, increased g-tolerance and versatile head-up fire-control system (of the F-16) have produced a significant improvement in close-in air-to-air combat capabilities."

Savings and Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of April were as follows:

Salaried:	
Government Bonds	$2.1457
Diversified Portfolio	$1.3844
Hourly:	
Government Bonds	$2.1455
Diversified Portfolio	$1.4162
General Dynamics Stock	$31.00

Four Australian Pilots Evaluate F-16 at Fort Worth and Edwards

Four Royal Australian Air Force (RAAF) pilots flew 11 flights in an F-16 recently to evaluate the performance of the multirole fighter, which is under consideration for purchase by their country.

The RAAF airmen flew with General Dynamics test pilots in a two-seat F-16B fighter-trainer at Edwards AFB, Calif. In addition, Australian Defense Department experts visited Fort Worth for four weeks to examine the aircraft's capabilities and to discuss production, industrial offset and other matters concerning the F-16.

Most of the flights took place at the U.S. Air Force's Flight Test Center at Edwards AFB, Calif. The aircraft flown by the Australians is a production model that is assigned to U.S. Air Force's first operational F-16 unit, the 388th Tactical Fighter Wing at Hill AFB, Utah.

During a 15-hour flight program, the RAAF pilots flew a variety of missions, including air superiority, air defense, combat air patrol and close air support.

Air Vice Marshall H. A. Hughes, leader of the Australian team, flew the F-16 at Carswell AFB, Tex., adjacent to the GD plant. He landed the aircraft from the back seat and is one of the first pilots to do so on his first flight.

Wing Commander Bruce G. Grayson made five flights, four at Edwards and one at Fort Worth. Wing Commander Robert V. Richardson also flew the F-16 four times—the final flight a ferry and night evaluation operation from Edwards to Fort Worth. Group Captain O. G. Worth flew the plane at Edwards.

S-C Announces New Telephone

Stromberg-Carlson announced the introduction of the Push-Pulse™ Telephone. The new telephone will be available to independent telephone companies and to the retail market in the last quarter of 1979.

The telephone, offered in the Slenderet® design, uses solid state technology and push-button dialing on a telephone line designed for either rotary dial or Tone Dial® service. In addition, last number re-dial is provided by simply depressing the "#" button on the dial. The S-C Push-Pulse is the only electronic type telephone that does not require an auxiliary power source to accomplish either function. The use of solid state technology in the Push-Pulse telephone further minimizes maintenance costs, and, in addition, reduces the weight of the handset by 25 percent.

Moving Experience. *Electric Boat's former tug, Kingston II, moves the 138-year-old whaling ship* Charles W. Morgan *to her regular berth at the Mystic (Conn.) Seaport. Moves at the Marine Museum's shipyard prior to the* Kingston's *arrival had depended on light craft which had little power. The* Kingston, *which was recently donated to the museum by EB, pushed submarines at the Groton shipyard for 42 years.*

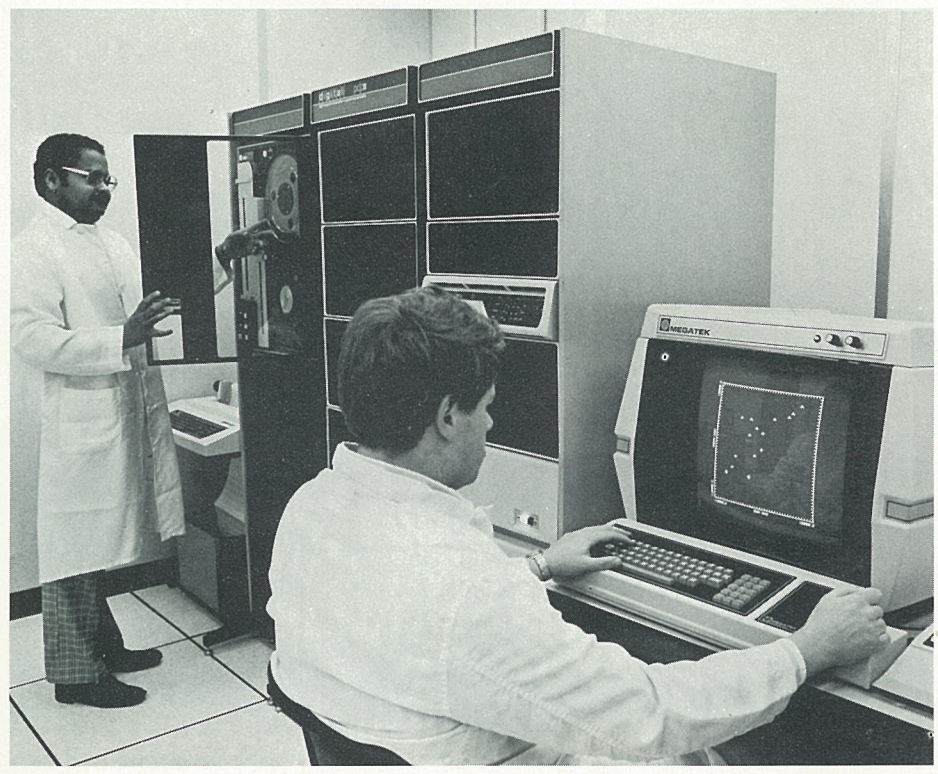
Convair Receives USAF Missile Computer Contract

A $2.67 million contract has been awarded to Convair Division by the U.S. Air Force for the development of a Digital Integrating Subsystem (DIS) which has the potential of providing the electronic "brains" for future Air Force tactical missiles.

The contract, awarded by the Armament Development and Test Center at Eglin AFB, Fla., involves the design of a new small standard computer, several of which, working together over a "party line" link, would perform all the signal processing functions within a missile. The system would control wing and tail sections, receive data from missile seekers and take data from the altimeter.

The contract also designates Convair as the avionics integration contractor for the Midcourse Guidance Demonstration Program, an Eglin flight test program aimed at verifying seekers used in locating and homing in on a variety of targets.

Under the DIS contract, Convair will provide 25 computers and two sets of support equipment. The systems are scheduled for delivery to Eglin beginning in mid-1980.



Preparing for Battle. *While Edwin Quinones (standing), Software Engineer, Western Data Systems Center, Pomona Site, loads a display program he developed for simulated battle analysis into a computer, Brian Davis reviews the 'ocean' scene that shows both hostile and friendly naval forces before an attack. The special computerized program allows Pomona analysts to test systems equipment effectively in a laboratory.*

Tomahawk Displayed. *Tomahawk T-4, the first Convair cruise missile to be launched, was on display recently at the Association for Unmanned Vehicle Systems symposium at the Del Coronado Hotel in San Diego. T-4 flew four separate missions, demonstrating Tomahawk's versatility: the first underwater launch, the first launch from a submarine, the first ground launch of a Tomahawk land-attack cruise missile and the first launch from a ship-motion simulator.*

Combat Simulation Lab Helps Pomona Analysts Test Systems

At Pomona's Combat Systems Simulation Laboratory (CSSL), ocean battles are fought regularly. Analysts program enemy forces to launch air and sea missiles at a friendly fleet and then carry out retaliation moves. After the battle, the analysts evaluate the counterattacking systems.

These battles, waged on a graphics display terminal and minicomputer instead of the high seas, allow Pomona analysts to effectively test systems equipment at a fraction of the cost of live sea trials and fleet exercises. The CSSL computer system is being used to simulate situations from simple firing engagements to full-scale battles.

Jack Clearwaters, Group Engineer, Combat Systems Center, says, "While simulations do not replace sea trials and fleet exercises, they do provide a laboratory in which combat system performance can be evaluated."

Experiments with computerized battles are particularly helpful in evaluating various mixes of radar sensors, weapons and command-and-control doctrines for both single ship and fleet operations. These experiments also identify problems such as sensitivity to jamming devices and allow evaluation of proposed solutions. They have already been used on such products as Standard Missile-1, Standard Missile-2, RAM and Phalanx.

A typical battle begins when analysts design an attacker's capabilities and then design the sensors, missiles, gun systems and command - and - control systems of the friendly forces. The computers then simulate the behavior of each of these systems in the simulated engagement.

"Weapon performance, effects of battle damage, reliability of equipment and operator decision processes can be evaluated if the model is designed properly," says Mr. Clearwaters.

Entry Level Training Gives 30 Students Machine Skills

Through a joint venture of the Pomona Division, the Los Angeles Area Urban League, the Pomona Unified School District, and local businesses, 30 participants in the Skills Training Improvement Program (STIP) have received certification as entry level machine operators at the Pomona division.

"STIP provides up to 18 months of entry level training for highly skilled jobs needed in private industry," said Don Carlson, Pomona's Director of Industrial Relations. The local businesses donate time, training supervisors and supplies to assist in providing machine operator training for unskilled persons to fill shortages in local industry.

The STIP at Pomona began a few years ago after Pomona and Urban League officials discussed the area's high unemployment rate and GD's need for skilled machine operators. Since that time, the program has involved more than 200 persons in the Pomona, La-Verne and San Dimas, Calif., areas. Fifty have joined the Pomona Division.

Training is conducted at the Pomona School District's Park West Skills Center. GD has donated milling machines, lathes and drill presses.

Convair Service Awards

35 Years

Research and Engineering: L. J. Solheid.

Operations: R. D. Bauld, A. M. Goldstein, C. L. Smith.

30 Years

Quality Assurance: R. H. Collins.

Operations: T. J. Nilsson, J. R. Estrada, K. F. Eveland, V. E. Distad, L. Spurgeon, E. H. Vossen, J. L. Vidovich.

Research and Engineering: L. G. Curtis, J. S. Foster, R. E. Dietz, H. C. Jackson, Jr., C. L. Glasson.

Industrial Relations: D. V. Corrao.

25 Years

President's Office: A. Brown.

Material: H. A. Billings.

Industrial Relations: D. L. Watson.

Contracts: H. F. Spuehler.

Data Systems Services: J. L. Greenstein.

Marketing: E. J. Velton.

Operations: R. C. Dorame, A. R. Flores, E. L. Crawford, W. Horn, J. T. Treat, C. T. Chunn, P. E. Moore, Jr., M. R. Hawley, R. M. Gallego, A. R. Carvajal.

Quality Assurance: G. H. Townsend, R. R. Robinson, E. C. Wright, Jr.

Research and Engineering: R. I. Barnes, F. H. Bloschies, F. J. L'Heureax, E. C. Laudeman, E. V. Mansfield.

At Electronics

40 Years

R. W. Allen, D. C. Longacre.

25 Years

E. B. Milner.

20 Years

R. G. McKellips, J. Stillwater, L. F. Williams.

GD World

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G. Alexander Smith — Manager of internal communication

L. Christine Cascella — Associate writer

Jack Isabel, Doug Robertson—Contributing editors, Convair Edition

New Facility to Revolutionize Sub Construction

Five months after start of construction, the new $100 million automated submarine frame and hull cylinder manufacturing facility being built at Electric Boat's Quonset Point facility is beginning to take shape.

The highly advanced facility, which will revolutionize EB's submarine manufacturing methods, will allow simultaneous welding of 33 hull cylinders, using the most modern and sophisticated equipment and technology. Hull cylinders manufactured at Quonset Point are barged to Groton where they are joined to form the hulls for the 688-class and Trident submarines currently under construction at EB.

When operational, the new facility will significantly reduce the time required to produce the cylinders and at the same time improve quality.

The main crane support structure of the new facility will cover the equivalent of six football fields and will tower 125 feet high.

The new addition to the Quonset Point facility, which was announced last year, is the largest single capital expenditure of the nearly one-quarter billion dollars in capital improvements planned by General Dynamics this year.

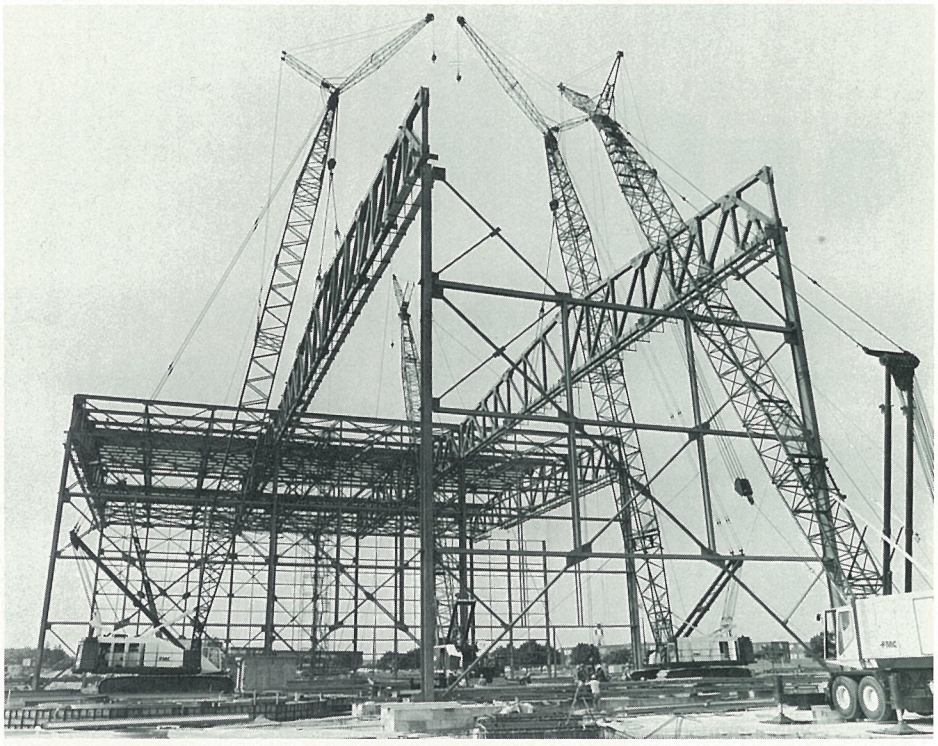
The 1979 expenditures follow the nearly $700 million that has been spent in the past five years for expansion and modernization of the company's plants and equipment.

While the Quonset facility is the most visible of the 1979 capital improvements, almost every division and subsidiary in the company will receive funds for modernization or expansion of facilities and equipment this year.

In the aerospace area, Fort Worth, Electronics, Convair and Pomona all are in the process of upgrading or expanding their facilities to provide for their major development and production programs, such as the F-16, Phalanx, the cruise missile and Stinger.

The resources subsidiaries, Material Service, Marblehead Lime, Asbestos Corp. and Freeman United Coal Mining Co., continue a major program for improving and expanding their production facilities. In this area, major funds have been allocated for the continuing construction of Freeman's Crown III underground coal mine in central Illinois.

Stromberg-Carlson, American Telecommunications Corp. and DatagraphiX, the telecommunications and data products subsidiaries, are also in the process of expanding and upgrading their facilities to take advantage of the increasing markets for their products.



Going Up. *Construction work was well under way on the automated submarine frame and cylinder manufacturing facility at Quonset Point, R.I. in May. The project is the largest single capital expenditure this year for General Dynamics and, when completed, will improve submarine production at Electric Boat.*

Dutch Air Force Receives F-16s At Ceremony Near Amsterdam

Continued from Page 1

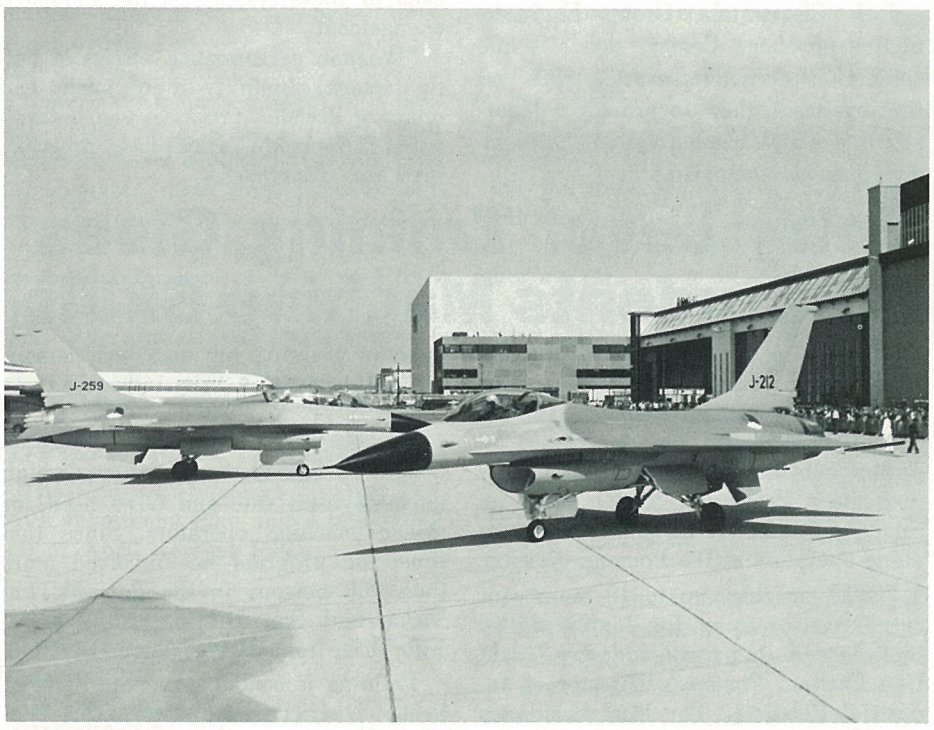
most 12,000 man-years of work, which is in line with the agreements made in 1975," he said.

"The F-16 program shows the possibilities of trans-Atlantic cooperation within our alliance," the minister added. "Moreover, it is a remarkable step towards standardization which is so urgently needed among the allied forces."

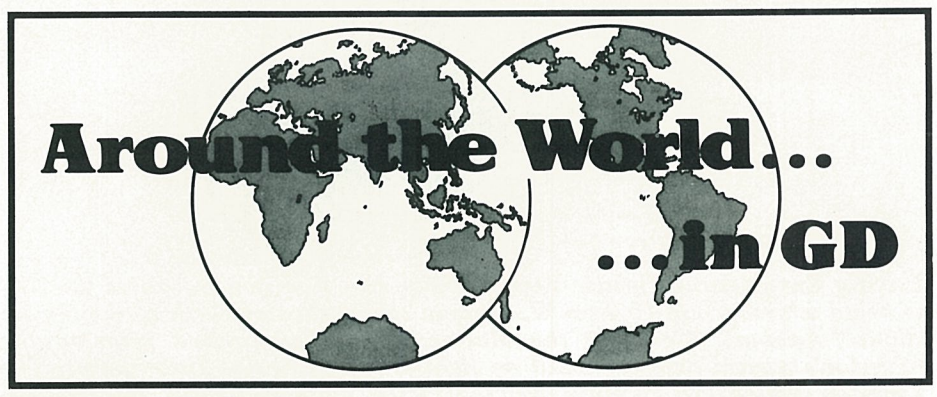
Ambassador Joseph, speaking on behalf of the U.S. Government, sounded a similar theme, describing delivery of the "much-acclaimed F-16" as a "day worth celebrating." The ambassador said that when the complicated coproduction program began, "there were skeptics by the dozens on both sides of the Atlantic" who doubted it could succeed. Those skeptics, she said, were proved wrong not only by the "two fine specimens" of aircraft that were delivered at the ceremony, but by the fact that they were delivered ahead of schedule.

"The F-16 program has made a significant contribution to improving NATO's effectiveness," she said, noting further that "in a dangerous world, cooperation among nations . . . is not a matter of choice, but necessity."

Following the ceremony, the two aircraft took off in formation, and the RNLAF pilots circled and made a low-level fly-by over the crowd outside the assembly building. The next day they flew to the RNLAF base at Leeuwarden in northern Holland where they will be stationed.



Taxi Out. *Two F-16s delivered to the Royal Netherlands Air Force on June 6 by Fokker-VFW taxi out for a flyby over the plant near Amsterdam.*



At CHQ: *David R. Moyer* transferred from Electronics and was promoted to Auditor . . . *Daniel W. Cape* was promoted to Corporate Manager – Financial Planning – Marine . . . *Patrick J. Holmes* joined as Corporate Manager Consolidation Accounting . . . *Mary Jo Frick* was promoted to Corporate Art Specialist . . . *Jacques F. Pousset* was named Corporate Marketing Manager – Far East – Tokyo . . . *Paul T. Cook* transferred from Pomona and was promoted to Corporate Marketing Representative – Middle East – Athens . . . *Gregory J. Benken* joined as Supervising Senior Auditor.

At Convair: *Charles E. Southwick* transferred from St. Louis as Director of Legislative Affairs . . . *George W. Roos* transferred from Fort Worth and was promoted to Director – Integrated Logistics Support . . . *Dario E. DaPra* was promoted to Engineering Director Test & Evaluation . . . *Daniel A. Heald* and *Aadu Karemaa* were promoted to Engineeering Chief . . . *Carl F. Peters* was promoted to Engineering Manager.

At Electric Boat: *Clifford L. Stehle* was promoted to Manager of Trade Planning . . . *Edward J. Dunham* joined as Manager of Security . . . *David L. Downs* was promoted to Supervisor, Engineering.

At Electronics: *Leroy A. Best* joined as Director of Marketing Production Support Programs . . . *Wayne B. Knight* joined as Engineering Specialist . . . *Ronald E. Santina* joined as Proposals Manager, Senior . . . *Donald L. Sturek* joined as Senior Project Manager . . . *Carl W. Cisco* joined as Manager of Quality Assurance . . . *Nathaniel L. Cohen* joined as Engineering Specialist . . . *John G. Garcia* was promoted to Director of Marketing – Navigation & Range Programs . . . *Morton Kantor* was promoted to Engineering Manager . . . *Richard J. Archibald* was promoted to Director of Procurement . . . *W. P. Robertson* transferred from Fort Worth and was named Engineering Manager.

At Pomona: *A. B. Adler* transferred from Fort Worth and was named Marketing Manager . . . *Norman D. Barton* was promoted to Assistant Marketing Director . . . *John E. Kozyra* was promoted to Marketing Manager . . . *Howard D. McCoy* was promoted to Marketing Director . . . *Paul L. Boettcher, Wilmer J. Cook, Arnold M. Mikkelson* and *Edward T. Piesik* were promoted to Engineering Specialist . . . *Hideki Hamamoto* transferred from St. Louis and was named Assistant Marketing Director . . . *James R. Riggs* was promoted to Section Head . . . *Jay R. Stine* was promoted to Group Engineer.

At ATC: *Mark Darrow* joined as Account Manager for the Midwest Region . . . *John Tymoczko* joined as Product Line Manager – Electronic Station Products.

At Fort Worth: *Olaf Thiede* was promoted to Manager of Procurement . . . *Herbert C. Hayes* was promoted to Manager of Quality Assurance . . . *J. R. Thayer* transferred from Convair and was named Manager – International Resident Office – Denmark . . . *David J. Wheaton* was promoted to Marketing Director . . . *John H. Watson* was promoted to Engineering Chief . . . *Harold C. Hoffman* was promoted to Group Engineer . . . *Gilbert D. Mook* and *Ronald B. Schuh* were promoted to Marketing Manager.

At DSS: *Bernard J. Breen* was promoted to Manager – CAD/CAM – DSS . . . *George R. Widmeyer* transferred from CDSC and was promoted to Software Design Specialist at the St. Louis site . . . *Dean M. DeMoss* transferred from Fort Worth to CDSC as Software Engineering Specialist.

At Stromberg-Carlson: *Richard G. Winslow* transferred from Electric Boat and was named Director, Manufacturing Engineering . . . *Bum S. Park* was promoted to Program Manager, Telephone Systems at Charlottesville . . . *Geary R. Girard* was promoted to Materials Manager at Ardmore . . . *Michael L. Thomas* was promoted to Quality Control Manager at Ardmore.

At DatagraphiX: *Noble N. Tombaugh* was named Manager Finance – Europe.

At GDCC: *Jeff A. Sandels* was named Atlanta District Manager . . . *John A. Smith* has been named Manager of Employee Relations . . . *Gary L. Vilmer* has been named Manager of Audio Visual Programs . . . *David F. Witter* has been promoted to Contracts Manager . . . *J. Edwin Terry* has been named System Development Manager . . . *Jon C. Lowe* has been appointed manager of Configuration Engineering . . . *E. Michael Martin* was promoted to Southeastern Regional Manager . . . *William H. McCarty* was promoted to Great Lakes Regional Manager . . . *John D. VerMeulen* was promoted to Southwestern Regional Manager . . . *Susan Kuttner* was named Sales Training Manager . . . *Terry I. Phillips* was named System Development Manager – System Century Infotran DBX.

GD World

Vol. 9 No. 7 3 July 1979

Inside the World

Belgian Assembled F-16 Performs at Paris Air Show

Two General Dynamics test pilots put a Belgian Air Force F-16B through its paces before thousands of spectators at the Paris Air Show, June 8-17.

Neil R. Anderson, Director of Flight Test at the Fort Worth Division, and GD Experimental Test Pilot James A. McKinney, took turns piloting the twin-seat fighter in the Air Show displays and in special demonstration flights for members of the U.S. Congress and representatives of the air forces of Australia, Korea, Greece and Switzerland.

The Belgian F-16, which was leased by General Dynamics for use at the Air Show, is the first of the 348 aircraft which will be assembled in Europe under the F-16 multinational coproduction program. The aircraft was delivered to the Belgian Air Force last January 26. During the show, it carried the flags of the United States, Belgium, Denmark, the Netherlands and Norway —the five countries participating in the coproduction program.

Hundreds of governmental, military and industrial officials from those and other countries visited the General Dynamics reception area at the Air Show, which included exhibits from Convair, Pomona and Electronics divisions. A full-size mockup of a Tomahawk cruise missile was on display, along with smaller-size models of the Phalanx, RAM, Sparrow, Standard and Viper weapons systems and a model of the F-16 Avionics Intermediate Shop.

Sen. Howard Cannon of Nevada, who presides over the Senate Armed Services Committee's reviews of tactical air power, piloted the F-16 for most of an hour-long flight with Mr. Anderson. Sen. Cannon is Chairman of the Senate Commerce Committee and its Aviation Sub-Committee and was President Carter's official representative to the Salon de l'Aeronautique et de l'Espace, the official name of the biennial Paris event.

A retired U.S. Air Force Reserve major general, Cannon reached a supersonic speed of Mach 1.35 at 36,000 feet and pulled more than eight g's, or the force of more than eight times his own weight, while performing aerial maneuvers.

Representative Eldon Rudd of Arizona, a member of the House Appropriations Committee and a former U.S. Marine Corps flyer, was another of the 'guest pilots' in the F-16. The flights, in an area distant from Le Bourget airport where the Air Show was held, were in addition to the 10 six-minute show flights which Anderson and McKinney flew to display the F-16's acceleration and maneuverability to the large crowds attending the show.

The F-16 displayed at Paris is one of 116 F-16s on order for the Belgian Air Force. In addition, 1,388 F-16s are now planned for the U.S. Air Force, 102 for the Netherlands, 72 for Norway, 58 for Denmark and 75 for Israel — an overall total thus far of 1,811. The multinational fighter is also a finalist in current competition in Canada, Spain and Australia.

Production of F-16 parts and components assembly is under way at Fort Worth Division and in more than two dozen cities in Belgium, Denmark, the Netherlands and Norway. Twenty-eight European firms are producing the F-16 components, avionics and equipment under contracts exceeding $1.5 billion.

Thus far in the F-16 program, full-scale development and production aircraft have made more than 4,850 flights.

Pomona Awarded Sensor Contract By U.S. Air Force

Pomona Division has been awarded a $6.4 million U.S. Air Force contract to develop a passive radio frequency homing sensor for the Low Cost Expendable Harassment Vehicle (LOCUST), an unmanned minidrone planned for use against enemy defenses.

The contract provides funding for the design, development test and evaluation of 50 sensors over a 30-month period.

The LOCUST is being codeveloped by the United States and the Federal Republic of Germany.

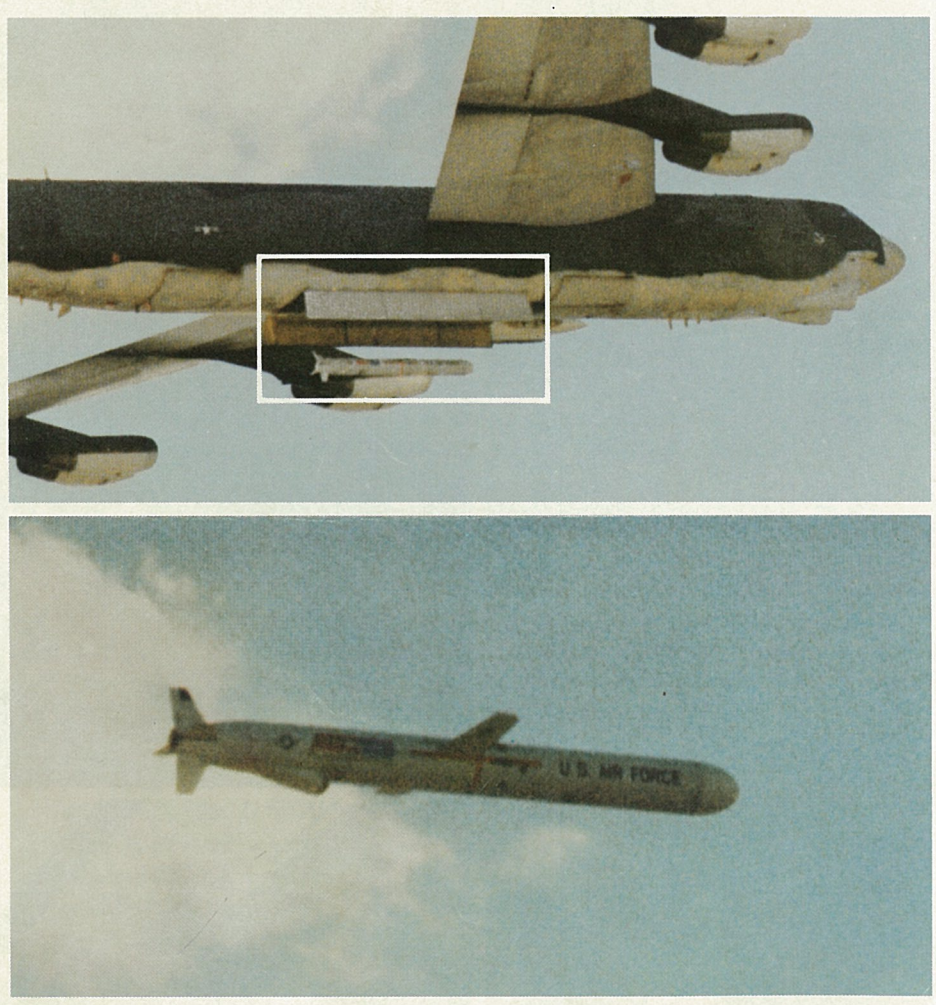
Roger Kathman, LOCUST Sensor Project Manager at Pomona, said, "The LOCUST will be an important element in the total effort to suppress enemy air defenses."

The Pomona-designed sensor will feature a built-in minicomputer that will control the drone's flight and provide automatic acquisition and identification of enemy targets.

The Pomona sensor will take part in a competitive flyoff with one being developed by Texas Instruments under a similar contract. The winner will be awarded a full-scale production contract. The flyoff is planned during the last eight months of the current contract period.

The LOCUST system is scheduled to move into full production by 1982.

The Belgian F-16B Prepares to Taxi Out for a Flight at Paris



Flyoff Begins. *A General Dynamics AGM-109 (top photo) is dropped from the bomb bay of a B-52G strategic bomber at the start of a test flight on July 17. The missile completed a highly successful flight to start the flyoff competition being staged by the Department of Defense.*

Air Launched Cruise Missile Makes Successful First Flight

A U.S. Air Force/General Dynamics AGM-109 Air Launched Cruise Missile (ALCM) made a highly successful flight on July 17 after being launched over Utah from a B-52 strategic bomber.

It was the first flight for the Convair-designed AGM-109 and the first flight in the competitive flyoff between the AGM-109 and the Boeing AGM-86B for selection as this country's strategic air launched cruise missile.

The winning design in the flyoff is expected to enter production in 1980, and, according to Department of Defense officials, over 3,000 ALCMs will eventually be produced to enhance the Air Force's strategic strike capability as a long-range standoff weapon system.

The AGM-109 was carried aloft from Edwards AFB, Calif., aboard a B-52G and was launched from the aircraft's bomb bay over the Utah Test and Training Range. Moments after release from a rotary launcher in the bay, the missile's wings, fins and inlet deployed and the turbofan cruise engine started.

The missile then navigated over the range using its terrain contour matching guidance system.

Following the test, the missile's parachute recovery system was activated, and the missile was recovered. It will be returned to Convair where it will be refurbished for another flight in the ALCM competition.

The AGM-109 is 20 feet long and 21 inches in diameter with a wing span of eight feet seven inches.

The missile is powered by a compact turbofan engine in the 600-pound thrust class. Guidance is provided by an inertial navigation system with terrain contour matching (TERCOM) which compares measured terrain heights with heights stored in an on-board computer and corrects the missile's course and altitude based upon the navigation fix obtained.

The missile has a range of more than 1,500 miles and cruises at very low altitudes at speeds of more than 500 miles per hour.

The competitive flyoff between the AGM-109 and the Boeing AGM-86B will continue through the remainder of this year.

During the competition, each missile will make 20 flights over portions of California, Nevada and Utah. Ten of the flights will be 'captive carry' missions in which the missiles will remain attached to the B-52G launch aircraft. The missiles' navigation systems will be checked by using them to direct the B-52 over a pre-designated route.

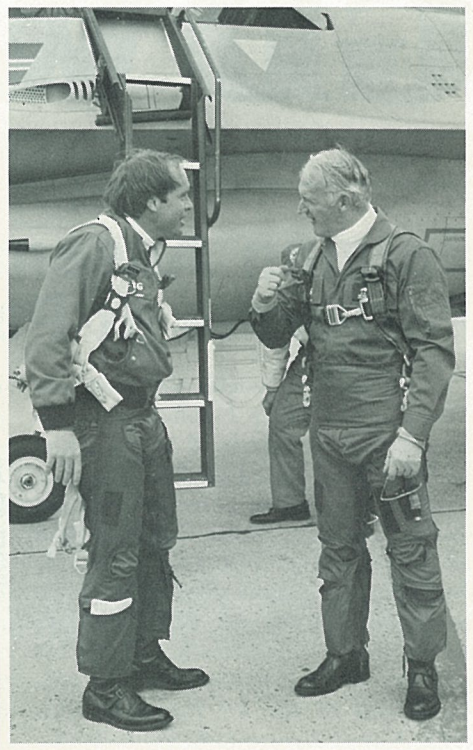
In some free flight tests, the missiles will be launched from the B-52 over the ocean off the California coast, head inland over California and fly pre-planned routes to the Utah Test and Training Range. In other tests, missions will be flown within the Utah range.

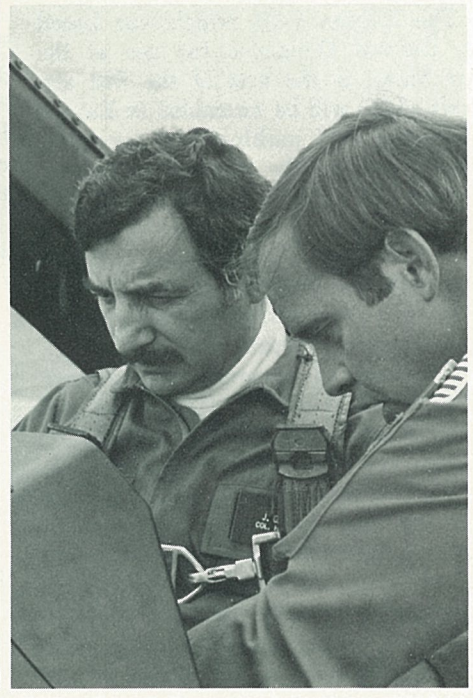
At the conclusion of the flyoff, data from the flights and other factors such as life-cycle costs, production plans and facilities of the competing companies will be used in selecting the winning design. According to the Department of Defense, the production contract value to the winning firm could exceed $2 billion.

The AGM-109 is a derivative of the General Dynamics Tomahawk cruise missile which has made over 40 test flights to date after launch from submarines, aircraft and ground platforms.

Another variant of the Tomahawk is the BGM-109 Ground Launched Cruise missile which is being developed by Convair for the Air Force's Tactical Air Command to enhance its theater strike capability and provide the tactical air forces with increased nuclear firepower. The first ground launch of a BGM-109 occurred in February 1977.

A team of approximately 100 Convair employees is assigned to Edwards AFB, Calif., the flyoff staging base, to support the AGM-109 during the competition.





(Center photo courtesy *Aviation Week & Space Technology:* Copyright McGraw-Hill, Inc.)

Guest Pilots. *A number of military and governmental officials from around the world flew the Belgian Air Force F-16B which was displayed at the Paris Air Show in June. Col. Paul Leuthold (top left), Swiss Air Force, prepares to climb into the cockpit. U.S. Representative Eldon Rudd of Arizona (top center) is briefed on the cockpit by Neil R. Anderson, GD Director of Flight Test. Air Vice Marshall J. H. Flemming (top right), Royal Australian Air Force, discusses his flight with James A. McKinney, GD Experimental Test Pilot. Col. P. Bekas (bottom right), Hellenic Air Force, is briefed on the F-16's cockpit by McKinney. U.S. Senator Howard Cannon (bottom center) of Nevada is welcomed back after his flight by Crew Chief Marion M. Nelson. Republic of Korea Air Force Brig. Gen. Yoon Soo Chun (bottom left) is briefed on the control surfaces of the F-16 by McKinney. In the center photo, vortices flow from the forebody strakes of the aircraft during a flight at the show.*

Savings Bonds To Be Replaced With New HH and EE Bonds

The U.S. Treasury Department will introduce two new series of Savings Bonds on Jan. 2, 1980, replacing the bonds which have been on sale since May 1941 and June 1952.

Secretary of the Treasury Michael Blumenthal announced recently that the Series E and H bonds will be replaced by Series EE and Series HH bonds beginning Jan. 2, 1980.

The Series EE bonds accrue interest, will be available in denominations of $50 or larger and will gain 50 percent to face value at full maturity in 11 years and nine months.

A Series E $50 bond now costs $37.50 cash, and at full maturity (five years) the bond has a cash value of $50. Under the new regulation, the Series EE $50 bond will cost $25. However, it will now take 11 years, nine months for it to reach full maturity – or cash value of $50.

The current income Series HH bonds will be available in denominations of $500, and interest will be paid every six months.

Series E Bonds sold through the Payroll Savings Plan will be phased out and replaced by Series EE Bonds between Jan. 2 and June 30, 1980. However, no over-the-counter sales of either E or H bonds will be made after Dec. 31, 1979.

The Treasury also announced that all Series E Bonds with issue dates on or after May 1, 1952, all H Bonds with issue dates on or after June 1, 1959, and all outstanding Savings Notes (Freedom Shares) will receive one 10-year extension of interest beyond the extensions previously granted.

Because interest on the new bonds will be the same as that on the old, there will be no advantage gained by cashing in Series E Bonds and then purchasing Series EE Bonds. All Series E Bonds will continue to draw interest at the highest authorized rate, now six percent when held to maturity.

Savings and Stock Investment Values

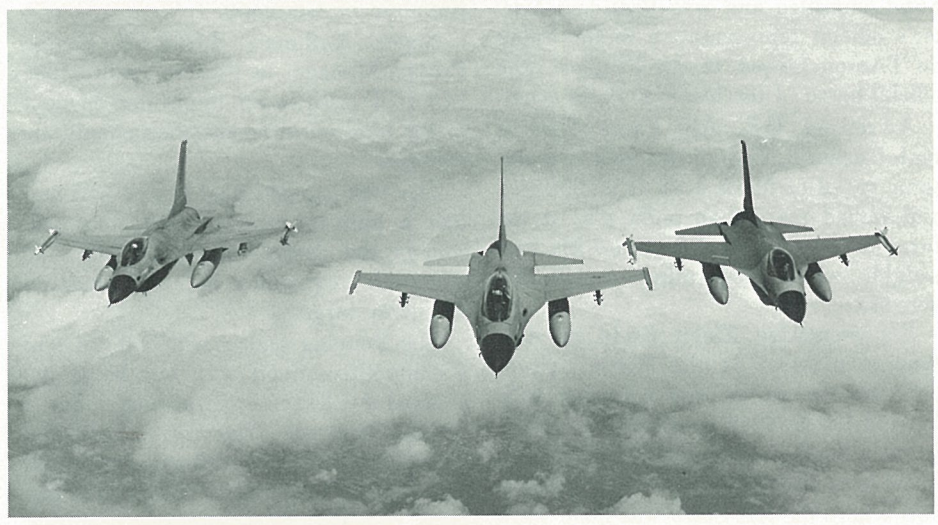
The General Dynamics Savings and Stock Investment Plan unit values at the end of May are as follows:

Salaried	
Government Bonds	$2.1637
Diversified Portfolio	1.3689
Hourly	
Government Bonds	2.1638
Diversified Portfolio	1.4004
General Dynamics Stock	28.875

GDCC Receives Analysis Contract

General Dynamics Communications Co. (GDCC) will make a corporate-wide analysis of GD telecommunications services and equipment.

After making the analysis, GDCC will prepare recommendations for a central system to connect all GD offices, subsidiaries and divisions.



Homeward Bound. *Three F-16s carrying 370-gallon external fuel tanks recently headed home from Europe to Edwards AFB, Calif., after four months of operations in the North Atlantic Treaty Organization (NATO) environment.*

U.S. F-16s Return Home After Testing in Europe

Three USAF F-16 Multirole Fighters returned to Edwards AFB, Calif., last month after four months of operational testing in Europe. A fourth F-16 had returned earlier after completion of landing drag chute tests in Norway.

The three F-16s operated from bases in Norway, Denmark, Germany and England in a program to measure the aircraft's ability to function in the demanding European flight and ground environment. The aircraft flew 142 sorties during the successful European deployment.

During the tests in the four North Atlantic Treaty Organization (NATO) countries, the aircraft were flown on a variety of air-to-air and air-to-ground missions, firing a number of missiles at air and ground targets and dropping various types of practice bombs. The F-16s frequently operated from hardened NATO aircraft shelters, and many times flew jointly with aircraft from allied nations.

Military test pilots from the U.S., Denmark, Norway and the Netherlands participated in the program.

The U.S. Air Force plans to base several hundred F-16s in Europe in the coming years. The Belgian and Netherlands air forces have taken delivery of their first F-16s, and the Danish and Norwegian air forces are scheduled to receive their first aircraft in January 1980.

75 Electronics Employees Given Awards, Certificates

Electronics Division received its second consecutive Top Performance Award in the corporation's Employee Suggestion Program (ESP) recently. ESP and Cost Reduction Program (CRP) awards, and certificates were presented to 75 Electronics employees at a Cost Reduction Awards breakfast at the division's Kearny Mesa plant. Electronics exceeded its 1978 CRP goal by 449 percent.

Commenting on the more than $13.8 million saved, R. H. (Dick) Nicholson, Chairman of the Electronics Cost Reduction Program, said, "This outstanding achievement in 1978 is an indication of the valuable talent and abilities of the men and women at this division." Mr. Nicholson said that the awards breakfast was held to recognize the cost reduction proposals that had been implemented in 1978 and "to honor the CRP reps who work so hard behind the scenes."

Two large banners were presented to the Manufacturing Engineering Department and the Manufacturing Department. Ron Sumner and Mark Williams accepted the CRP Banner for Manufacturing Engineering, and Harlan Baldwin and Lou Gardner accepted the Employee Suggestion Banner for the Manufacturing Department.

Individual certificates were awarded for suggestions that saved annual amounts varying from less than $500 to more than $3 million.

Electronics Employees Present Awards to Two ROTC Cadets

Herb Jordan and Gerry Schmidt of Electronics Division presented outstanding achievement awards to two cadets at the San Diego University Air Force Reserve Officers Training Corps (AFROTC) Awards banquet last month.

Mr. Jordan, Vice President and Program Director of the F-16 Avionics Intermediate Shop (AIS), presented the General Dynamics AFROTC Cadet Award to Cadet Michael Castellani for his military leadership abilities and high officer potential demonstrated during the past school year.

Mr. Schmidt, Project Manager at Electronics and President of the San Diego Chapter of the American Defense Preparedness Association, presented that organization's annual award to graduating Cadet Robert D. Botsford for his achievements in academics and athletics while in the AFROTC program. Botsford is now a new second lieutenant and is assigned to Mather AFB, Calif., for navigator training.

Both Jordan and Schmidt are familiar with the military. Jordan served in the Marines during World War II, and Schmidt is a colonel in the U.S. Marine Corps Reserve.

'Group Technology' Cuts Time Required for Machining Parts

A 40 percent decrease in fabrication time for production of machined parts has resulted from the use of "group technology" at Pomona Division. By using computers to aid in grouping parts of similar size and tolerance and grouping the machine tools required to produce those parts, manufacturing time has been reduced significantly.

"Applying this concept to the machine shop makes for a much more cost-effective manufacturing system," said Clarence Dwyer, group technology leader.

"Before using group technology, we tracked 150 parts and found they had required 87 routes and 51 machine tools throughout the factory," he said. "By grouping the machining processes, we used only eight machines and 31 routes."

In 1978, a group of machine tools was formed into a cell block, allowing for four to six operators to follow a part from its raw state to completion.

According to Leo Sullivan, machine shop superintendent, the grouping had a positive effect on job attitudes, quality of work and productivity. "The machine operators can now see the progression of a part from start to finish," he said. "Instead of just punching a hole in the same part day after day, now the operators follow and perform all the shaping, cutting, threading and finishing on a part before it leaves the area."

Said one operator, E. J. Herrera, "I now have a better perception of what exactly the parts we work on are."

Presently, there is one machine cell block at Pomona, and plans include three more by the end of this year.

"At this time, we see about 75 to 80 percent of the factory being run under the group technology concept in three or four years," said Mr. Sullivan.

"We have demonstrated that group technology works at this division and is a viable process to pursue in the future," he said.

Convair Service Awards

35 Years

Quality Assurance: F. Adams.

Operations: J. V. Backstrom, M. F. Gabriel, L. W. Roper

30 Years

Research and Engineering: J. C. Ramsey.

Quality Assurance: E. F. McCormick.

Data Systems Services: M. R. Wilson.

25 Years

Quality Assurance: S. W. Gill, M. Flores Jr.

Contracts: L. J. Chew.

Operations: L. R. Matthews, D. L. Baker, F. D. Robbins, P. R. Ewing, J. J. Nipper, J. M. Miller, D. M. Calvert.

Data Systems Services: R. J. Baldwin.

Launch Vehicle Programs: P. B. Van Alstine, D. B. Rodger.

Research and Engineering: J. D. Rhamy.

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G. Alexander Smith — Manager of internal communication

L. Christine Cascella — Associate writer

Jack Isabel, Doug Robertson—Contributing editors, Convair Edition

At Electronics

30 Years

R. A. Gregory.

25 Years

F. M. Frimann, E. B. Milner.

20 Years

R. L. Cooley Sr., J. Stillwater, L. F. Williams, J. C. Kowasch, W. S. Dingsdale, R. G. McKellips.

Successful Recovery. *A U.S. Air Force helicopter successfully retrieves a cruise missile during testing of the Air Force Mid-Air Recovery System (MARS) at the Utah Test and Training Range last month. MARS will be used to recover air launched cruise missiles after test flights.*

MARS System Recovers Cruise Missiles

Last month, the U.S. Air Force successfully conducted a series of tests on a system that will be used to retrieve air launched cruise missiles after test flights.

The Air Force Mid-Air Recovery System (MARS) was tested in a series of parachute drops at the Utah Test and Training Range.

MARS involves deployment of a small, doughnut-shaped drogue from a compartment in the missile which deploys a large parachute to slow the missile's descent. A helicopter then engages the drogue, the main chute drops away and the missile is winched up for the flight to a recovery area where it is lowered gently into a fixture. The system is designed to prevent damage to the missiles so that they can be used a number of times in the test program.

Convair Film Editor Wins Emmy For TV Program

John Gray III, a film editor who joined Convair 15 months ago in the Motion Picture and Television department, has won an Emmy from the San Diego Academy of Television Arts and Sciences for editing the TV film "Voyage of a Yankee Tuna Clipper." Mr. Gray edited the film before he joined Convair.

Gray was presented the award during the Emmy ceremonies last month. The film, which aired on San Diego's Channel 10 in June 1978, focused on the local tuna industry.

"It took six months to edit," Gray said. "The toughest part was trying to shorten the film to fit the hour-long format."

Gray has worked on a number of Convair films since he's been at the division, such as "Second to None" about the cruise missile program and a special film shown at the Paris Air Show last month. Before joining General Dynamics, he had his own production company and did freelance work on multimedia programs and commercials.

$5,000 Idea. *Sandy Diaz (left) and Chong Suh are recent recipients of an employee suggestion worth $2,500 each. The two metallurgical analysts suggested elimination of the 100 percent radiographic inspection of aluminum lead transistors for components used in the Sparrow program.*

Two Pomona Metallurgists Awarded $5,000 Prize

Two metallurgical analysts at Pomona Division suggested a change which saved the division $76,750, and they split a $5,000 suggestion award for their idea.

Sandra Diaz and Chong Suh suggested modification of the 100 percent radiographic inspection of aluminum lead transistors used in components of the Sparrow missile. In 1978, they had X-rayed 275,345 transistors at a cost of 15 cents each and found only a .0008 percent defect rate.

Under the new method of inspection, a random sample of 266 pieces per lot will be X-rayed. If no more than two of the samples fail the X-ray inspection requirements, the lot will be accepted. If three or more fail, however, the entire lot will be screened.

Electronics System to Provide Data on Cruise Missile Tests

A tracking system developed by Electronics Division will be used to provide tracking data and time monitoring of U.S. Air Force air launched cruise missiles during tests over Utah.

Electronics' High Accuracy Multiple Object Tracking System (HAMOTS) installed at the Utah Test and Training Range will be used to obtain accurate reference tracking information of the cruise missiles during the competitive flyoff tests between the General Dynamics AGM-109 and the Boeing AGM-86B.

HAMOTS transponders will be installed in the cruise missiles which will be tracked during the flights over the training range. Once the data is processed, it will then be presented on a large screen display where a test director will be able to visually track and monitor the test missiles.

HAMOTS is one of five Range Measurement Systems (RMS-2) produced by Electronics for the Department of Defense, U.S. Air Force and U.S. Army since 1970. Another system is currently supporting a joint service operations test at Fort Hunter-Liggett, Calif. These tests utilize the RMS-2 system to track, monitor weapons firing, and provide scoring for a combined force of more than 120 air and ground participants.

The latest in air, land and sea range tracking system technology being offered by Electronics is the Air Combat Maneuvering Instrumentation (ACMI) system. Electronics has submitted proposals to the Royal Canadian Air Force and the Air Force of the Republic of China (Taiwan) for ACMI. Additionally, Israel, Korea and Japan have expressed interest in the system which makes expanded use of tracking hardware and software from the RMS-2.

Among the features of the ACMI is its ability to provide tracking coverage for large, diverse geographical areas and to track multiple participants. This allows the system to be used for realistic air-to-ground and ground-to-air scenarios, involving large numbers of ground force tactical vehicles, as well as the traditional air-to-air application.

La Jolla To Be Launched At EB Ceremony August 11

A large delegation of Southern Californians and several thousand employees and their families are expected to be on hand August 11 at Electric Boat Division for the launching of the 688-class fast-attack submarine *La Jolla* (SSN701).

Named for a section of San Diego, the sub will slide into the Thames River during 11:30 a.m. ceremonies at the shipyard. Sponsoring the ship will be Shirley Haughey Wilson, wife of California Congressman Bob Wilson, who will be the principal speaker.

Congressman Wilson, a member of the House of Representatives since 1952, is the ranking Republican member of the House Armed Services Committee and a member of the Permanent Select Committee on Intelligence. He formerly served on the Select Committee on Aging.

Mrs. Wilson initialed the keel of *La Jolla* October 16, 1976, during ceremonies marking the formal start of construction.

The launching will be the third this year at the division. The first Trident missile-firing submarine, *Ohio* (SSBN-726), was christened April 7 and *Dallas* (SSN700), another fast-attack sub, was launched April 28.

Legitimate Lock-Picker Solves Key Problems in EB Shipyard

Tony Mares gets paid for picking locks. And it's all on the up-and-up.

Mr. Mares is Electric Boat's locksmith, the man who's called when something goes wrong with one of the 9,000 key locks around the shipyard. Actually a carpenter, Mares fell into his present specialty 12 years ago when EB changed to a lock system using interchangeable cores, small cylindrical devices that fit into a doorknob to receive a key. The system permits changing the core rather than an entire lock.

Sitting at the bench in his tiny workroom surrounded by bins and boxes full of hundreds of door knobs and locks, Mares explains why he was chosen for the job. "I'd been doing a lot of maintenance carpentry, I guess they thought I'd be a natural at this."

No one would fault that decision. "See this," Mares says, grabbing a door knob from a nearby bin. "That contains a run-of-the-mill lock. And this is a mortice lock," he explains, pulling one with a wedge-shaped latch from another bin. "Very common."

Reaching to more bins, he demonstrates five more types of locks—jimmy proof, night latch, deadbolt, alarm bar (emits an electronic signal when opened) and combination. Mares is master of all of them.

How does he rate himself at his work? "I guess I do okay," he replies modestly. "If I had flubbed up, they would have gotten someone else."

Modesty aside, flubbing up would be easy to do in the EB lock business. Besides learning the intricacies of the five types of locks, Mares has to keep track of a number of six-digit formulas in a complex system worked out by the lock manufacturer. The formulas dictate the number of ridges (called "cuts" and "spaces") in the shank of a key.

There are five keys for every lock—the control key (that pulls the core); the grand master (opens any lock in the plant); master (fits a series in a building or area); submaster (handles a smaller number of series locks), and the operating key (for everyday use).

Armed with such data and a few well-chosen tools of the trade, Mares goes about his work, much of which involves immediate action. A few years back, for example, he responded to a call from a person whose office door lock had been crammed full of paper book matches. Using a key, Mares worked the matches out and freed the lock. "I got the feeling that someone didn't like the guy," Mares recalls with a smile.

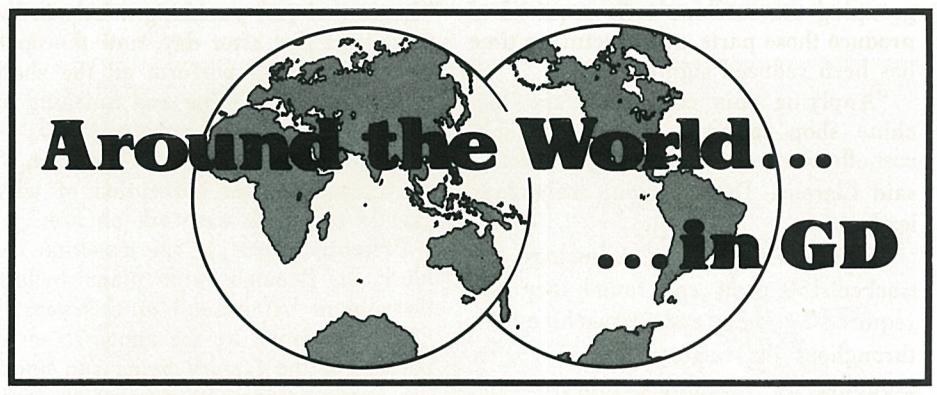
Once, 12 employees were locked out of a storehouse. No keys would work. Mares finally had to run an extension cord more than 100 feet from a neighboring building and drill the lock out.

Another time, he had to get into a vault by taking the steel door off. How did he do it? "With great difficulty," he recalls, adding that he used a pry bar and screw driver.

After 12 years, Mares finds almost no lock jobs that can stump him. Like anyone with a good deal of experience, he can handle just about everything that comes his way.

And, as expected, he's good with tips for anyone who has ever felt the frustrations of doing battle with a cantankerous lock. "Just jiggle the key lightly in the lock," he advises. "Don't declare war on it." What if it still won't open? "Call a locksmith," he shrugs, grinning.

Maverick Launch. *A television-guided Maverick missile is fired from an F-16B during a recent flight over China Lake, Calif. During the flight, the aircraft was piloted by U.S. Air Force Lt. Col. Tuck McAtee with Maj. Sven Hjort of the Royal Danish Air Force in the rear seat. More than 20 of the highly accurate air-to-ground missiles have been successfully launched from the F-16 to date. During this flight, the aircraft was loaded with six Mavericks, two 370-gallon external fuel tanks and two Sidewinder air-to-air missiles. The F-16 can carry up to 15,200 pounds of external stores.*



At CHQ: *Denis E. Bohlman* joined as Corporate Manager-Contracts . . . *Kenneth G. Geraghty* transferred from Pomona as Corporate Development Analyst . . . *William H. L. Mullins* joined as Corporate Assistant Director-Legislative Affairs in Washington . . . *Edward J. Stiften* joined as Corporate Senior Staff Accountant . . . *Thomas P. Scheve* joined as Corporate Graphics Specialist.

At Pomona: *Arleigh P. Helfer* joined as Manager Department Administration . . . *Howard D. McKoy* was promoted to Marketing Director, Plans and Administration . . . *J. B. Wilson III* was promoted to Manager, Asset Management . . . *Lief R. Roys* was promoted to Supervisor, Financial Accounting . . . *Steve G. Eggen* was promoted to Supervisor of Cost Accounting . . . *Jess A. Shaner* has been assigned to Chief, Audit Liaison . . . *Dick Woodruff* was promoted to Chief of CIWS/Defense Suppression Estimating . . . *Paul Miller* was assigned to Chief of Sparrow Estimating.

At Electric Boat: *Robert A. Nowack* was promoted to Superintendent-Weld/Lead . . . *C. A. Petchark* was named Industrial Relations Staff Specialist . . . *Lionel W. Taylor* was promoted to General Superintendent-Machine Shop . . . *George J. Trauch* was promoted to Director of Engineering at Quonset Point.

At Electronics: *Albert U. Dendo* joined as Manager of Requirements Analysis.

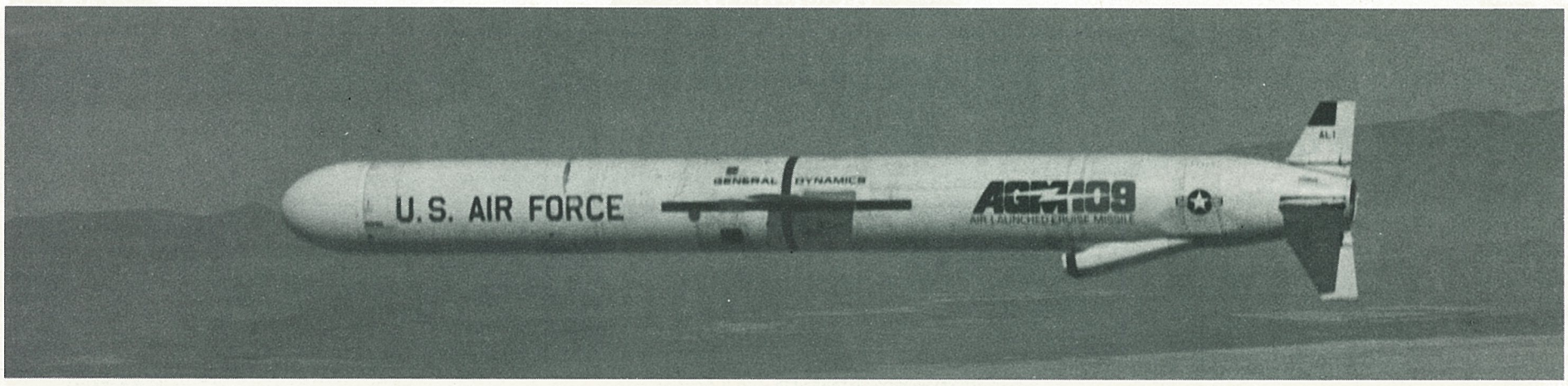
At ACL: *Andre Allaire* was promoted to Project Manager . . . *Lorne Taylor* was promoted to Manager-Technical Services.

At Freeman United: *Ramesh Malhotra* was promoted to Assistant Vice President-Marketing . . . *Patrick D. Callebs* was hired as Superintendent-Crown III Mine.

At Convair: *Henry Z. Hyman* transferred from St. Louis as Engineering Manager.

At Stromberg-Carlson: *Geoffrey A. McCarron* transferred from St. Louis and was promoted to Industrial Relations Manager/Charlottesville . . . *Robert T. Hayde* transferred from St. Louis and was promoted to Manager International Headquarters/Marketing.

At DSS: *James R. Stallard* joined as Professional Development Specialist . . . *Billy J. Haire* was promoted to Supervisor-Engineering Software at Western Data Systems Center.



Successful Test. *A U.S. Air Force/General Dynamics air-launched cruise missile (ALCM) flies over the Utah test range on August 1 during the second successful flight of the Convair-built missile. In each of the flights, the missile was ejected from the bomb bay rotary rack of a B-52G strategic bomber. Eight more flights of the Convair ALCM, designated AGM-109, are scheduled to be flown in the competition for a major new weapon system contract.*

Earnings Set New Record In 2d Quarter

GD World

Vol. 9 No. 8 3 August 1979

Strong performances throughout the company produced outstanding results for the second quarter, according to David S. Lewis, Chairman and Chief Executive Officer.

Earnings for the second quarter of 1979 were $47.8 million, or $1.77 per share, a record for the period and 56 percent higher than earnings from operations in the same period of 1978.

In the second quarter of 1978, earnings from operations were $30.7 million, or $1.15 per share, before consideration of the net loss of $186.7 million which resulted from the settlement negotiated with the U.S. Navy in June 1978 covering cost overruns on submarine construction contracts at Electric Boat Division.

Earnings for the first half of 1979 were a record $77.3 million, or $2.85 per share, compared to earnings from operations in the same period the previous year of $50.5 million, or $1.89 per share, before consideration of the Navy settlement.

After giving effect to the Navy settlement, the company reported net losses for the second quarter and first half of 1978 of $156 million, or $5.84 per share, and $136.2 million, or $5.10 per share, respectively.

All per-share figures have been adjusted to reflect the two and a half for one stock split which was effective Jan. 19, 1979.

Sales for the second quarter and the first half of 1979 were $1.02 billion and $1.91 billion, respectively, compared with $789 million and $1.5 billion for the same periods in 1978.

Funded backlog at the end of the second quarter this year was $10 billion,

Continued on Page 2

La Jolla Launched at Groton

The nuclear attack submarine is the "most effective and most cost-effective antisubmarine weapon in our arsenal."

With those words, U.S. Representative Bob Wilson set the theme for the launching ceremonies of the high-speed attack submarine *La Jolla* (SSN701) at Electric Boat Division on August 11.

Speaking before a crowd of more than 6,000 invited guests and shipyard workers and their families, Rep. Wilson, the ranking Republican on the House Armed Services Committee, called the attack submarine "the main striking power of the fleet," and the modern nuclear submarine "most versatile weapons platform in the world."

Mrs. Shirley Wilson, wife of the California Congressman, sponsored the sleek, 360-foot-long, 6,900-ton *La Jolla*—the ninth 688-class submarine to be launched at Electric Boat.

With the words, "I christen thee *La Jolla*. May God bless her and all who sail in her," Mrs. Wilson smashed the traditional bottle of champagne on the sub's bow.

At the same instant, Bernard Gillis, an EB carpenter with 45 years of service, shoved forward the trigger which released the submarine for her slide into the Thames River.

In welcoming the crowd on hand for the ceremony, P. Takis Veliotis, General Dynamics Vice President and General Manager of Electric Boat, called the Groton shipyard "unique because of its people."

"Electric Boat men and women," he said, "have a tradition of excellence and craftsmanship which is unmatched anywhere in the shipbuilding industry."

Mr. Veliotis mentioned the "dozens of families" who have worked at EB from generation to generation. "They are the backbone of the successes which over the years have been accomplished here on the banks of the Thames."

Veliotis termed EB "an exciting example of the kind of productivity which can be achieved through the right combination of technology, facilities and skilled people, working together with purpose and enthusiasm." He added that "this combination is working more efficiently and effectively today than ever before in Electric Boat's history."

David S. Lewis, Chairman and Chief Executive Officer of General Dynamics, echoed those sentiments during his remarks. "This shipyard is doing a splendid job," he said, crediting "the great work of all the people here."

The launching was the third this year at the shipyard. In April, the yard launched the *Dallas*, another 688-class ship, and the *Ohio*, the first Trident missile-firing submarine.

The *La Jolla* will have the most advanced antisubmarine capabilities combined with power weapon systems and electronic sensors.

General Dynamics has built more than one third of the Navy's current fleet of nuclear submarines.

First Phalanx Delivered To U.S. Navy

The first production unit of the Phalanx gun system was "rolled out" at Pomona Division during ceremonies at the plant on August 9.

Hundreds of employees, Navy officials and guests attended the ceremonies, which marked a major milestone in the 10-year program to develop and produce an all-weather, automatic gun system designed to protect U.S. Navy ships against sea-skimming antiship missiles and attacking aircraft.

James M. Beggs, General Dynamics Executive Vice President—Aerospace, told the crowd that the development of the Phalanx "represents a technological breakthrough in fire control technology that provides our nation's fleet with a new capability to defend itself against missile attacks," he said.

"We are proud of the General Dynamics team that made the technical breakthroughs to create this new defense capability . . ., and we can give the Navy every assurance that the same effort that developed Phalanx will be applied to meet our production commitments," Mr. Beggs said.

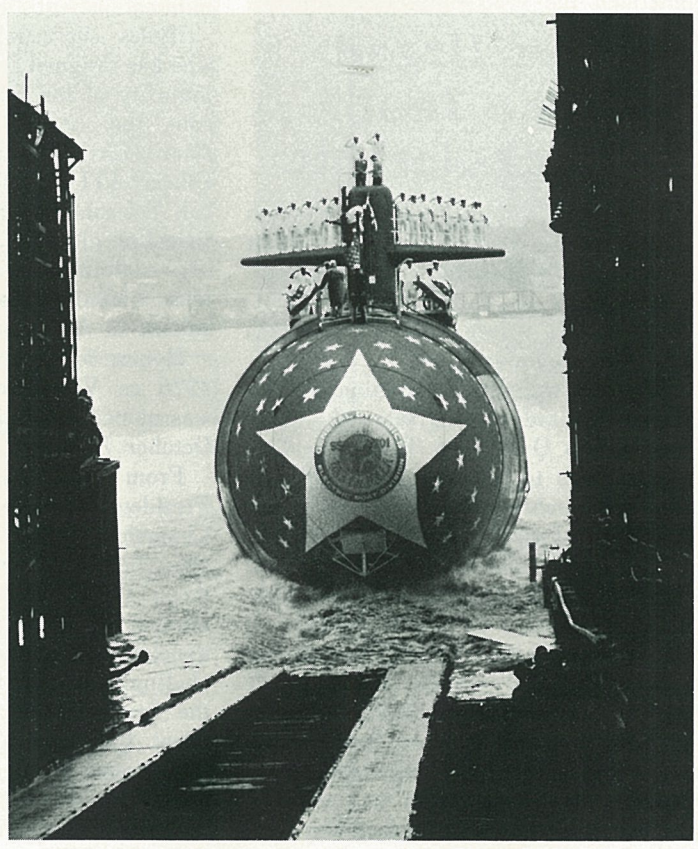
Rear Admiral Conrad J. Rorie, Deputy Commander for Weapons Systems and Engineering, Naval Sea Systems Command, said, "Phalanx is the most recent example of the nation's industry responding to our requirements for modern systems by developing advanced technology and matching it to practical applications to produce the systems required to defend our fleet."

Citing the efforts of the hundreds of people both in General Dynamics and the Navy who worked together to deliver the system, Adm. Rorie said, "We've worked together to develop and produce a system which . . ., when installed throughout the fleet, will give potential adversaries second thoughts about attacking us. I thank you and urge you to get on with the job of getting Phalanx to the fleet."

The Navy has announced that it plans to install the close-in weapons system on more than 240 ships, ranging from patrol boats to aircraft carriers. The first three units will be used by Navy Training Commands to school personnel in the system's operation and in maintenance procedures. The first ship to be equipped with Phalanx will be the aircraft carrier USS *Enterprise*.

The Phalanx system uses advanced radar and computer technology to pinpoint targets and automatically and continuously direct 20-mm cannon projectiles into a target. The system obtains

Continued on Page 4



Photos by R. D. Foreman

Two, One . . . Launch. *Mrs. Shirley Wilson smashes a a bottle of champagne on the bow plate of the* La Jolla *(left) as David S. Lewis, Chairman of General Dynamics, watches. Moments later, the* La Jolla *slides into the Thames River (right).*

Earnings Set New Record In 2d Quarter

Continued from Page 1

with funded and unfunded backlog totaling $11.5 billion.

"The results in the aerospace and marine divisions and the performance at Material Service and Freeman United Coal Mining compared to a year ago were especially noteworthy," Mr. Lewis said. In 1978, Freeman United incurred a substantial first-half loss as a result of the nationwide coal strike.

"The very important F-16 fighter program at Fort Worth remains on cost and on schedule while the production rate continues to accelerate," Lewis said. "The highlight of the quarter was the delivery of the first two F-16s to the Royal Netherlands Air Force from the Fokker-VFW assembly line near Amsterdam. Thirty-eight production aircraft have now been delivered to the United States, Belgian and Dutch air forces from our three production lines.

"We continue to be optimistic that the outstanding combat capabilities and the low cost of the F-16 will be significant factors in the current competitions for selection of new fighter aircraft by the governments of Australia, Canada and Spain."

Sales and earnings were also up at Convair and Pomona. The performance of Convair's air-launched cruise missile (ALCM) in its first two flights in the competitive flyoff with a Boeing cruise missile was in accordance with specifications, Lewis said.

The ALCM flyoff will continue throughout 1979, and the winner is expected to be selected and begin production in 1980. The Department of Defense has indicated that it will procure 3,000 ALCMs for carriage by B-52 strategic bombers to enhance the Air Force's strategic strike capability.

Pomona was awarded a $95 million contract in the second quarter for full-scale engineering development of the RAM guided missile weapon system. Development of this shipboard missile system, which will provide a low-cost, high-firepower capability for defense against enemy antiship missiles, is being sponsored jointly by the United States, Denmark and the Federal Republic of Germany.

Lewis said that sales and earnings at the telecommunications and data product subsidiaries, Stromberg-Carlson, American Telecommunications Corp., General Dynamics Communications Co. and DatagraphiX, were up over last year.

The company continues to contest the proposed takeover of its Canadian subsidiary, Asbestos Corp. Ltd. (ACL) by the Quebec government, Lewis said. While the provincial government has passed an expropriation bill which would enable it to take over ACL's assets in Quebec without notice, the company has filed suit questioning the constitutionality of that law.

"Even with all of this, we continue to hold discussions with representatives of the Quebec government and hope that an agreement can be reached that will be fair to all ACL shareholders," Lewis said.

Investment Values Savings and Stock

The General Dynamics Savings and Stock Investment Plan unit values at the end of June are as follows:

Salaried	
Government Bonds	$2.1830
Diversified Portfolio	1.4280
Hourly	
Government Bonds	2.1832
Diversified Portfolio	1.4608
General Dynamics Stock	32.25

F-16 Portrait. *This inflight portrait of a single-seat F-16A (left) and a two-seat F-16B (right) was taken by a pilot in a European F-104 during operations in Norway recently. Military pilots who flew the F-16 during the European flight operations praised the aircraft very highly.*

The F-16
Definitely a 'Fighter Pilot's Fighter'

Military pilots say they like the F-16 Multirole Fighter and foresee a vital role for this compact, highly maneuverable aircraft currently serving with the U.S., Belgian and Dutch air forces.

Following a recent hour-long F-16 flight at Hill AFB, Utah, Gen. Lew Allen Jr., U.S. Air Force Chief of Staff, said, "The F-16 will be a major and perhaps the major air combat capability of the Air Force, both in terms of the North Atlantic Treaty Organization threat and in terms of threats in other regions of the globe" in the coming years.

A veteran of nearly 4,000 flying hours, Gen. Allen noted that the General Dynamics-built fighter "clearly has a wonderful set of flying characteristics."

"The F-16 is a first-class weapon system in every respect," said Gen. W. L. Creech, Commander of Tactical Air Command (TAC) following his recent two-hour flight evaluation of the U.S. Air Force's newest fighter. "I was impressed with the handling characteristics, power and turning capabilities . . . It's a pilot's airplane. I like the way it flies. The F-16 will be a workhorse for TAC."

Lt. Gen. Marcel DeSmet, Chief of Staff of the Belgian Air Force, quickly demonstrated the F-16's high performance during air combat maneuvers on his initial flight. Gen. DeSmet said that the F-16 "is the sixtieth type of aircraft I have flown in my pilot career, but truly it is the one which gave me the highest satisfaction. What impressed me? The surprising acceleration, mainly on take-off, the vertical climbing rate and the outstanding maneuverability."

Royal Netherlands Air Force's (RNLAF) Capt. Bill Sneek is the first pilot to complete the F-16 multinational pilot training program at Hill AFB and is now back in the Netherlands helping to train other pilots who will fly the 102 F-16s planned for the RNLAF.

"It is an overwhelming experience to fly the F-16," said Capt. Sneek. "It makes me feel confident and comfortable. The F-16 is the most interesting and maneuverable plane I've ever flown."

The air forces of Denmark, Norway and Israel are scheduled to receive their first F-16s early in 1980.

In addition, Australia, Canada and Spain are evaluating the F-16 for service as their new fighter aircraft.

During a recent tour of Canadian Forces bases, 17 Canadian pilots put the F-16 through a variety of demanding aerobatic and combat maneuvers. First to fly was Chief of Defence Staff Admiral Robert G. Falls, who said that the F-16's capacity to accelerate and turn rapidly is "tremendous."

Col. Les Price, Commander of the Canadian Forces Fighter Weapon Center, noted, "You don't have to worry about flying it. It's designed to go after the mission—the airplane's supporting you instead of you supporting the airplane to accomplish the mission."

To date, more than 100 pilots have flown a total of 6,500 hours on more than 5,100 flights in F-16 production, developmental and prototype aircraft. Nearly 40 production F-16s have been delivered.

The F-16 can accelerate to a top speed of Mach 2, or twice the speed of sound. The Multirole Fighter can carry more than seven tons of weapons and fuel tanks externally. Equipped with two 370-gallon tanks, the fighter can fly nearly 2,200 nautical miles without refueling.

Juniors Urged To Take Test For Scholarship

Parents of children who will be high school juniors this fall and who want to compete for a General Dynamics National Merit or Achievement Scholarship, should insure that the students take the preliminary test in October.

The test, called the Preliminary Scholastic Aptitude Test/National Merit Scholarship Qualifying Test, will allow the students to compete for a GD college scholarship of up to $3,000 per year for four years of college education.

The test is administered by the National Merit Scholarship Corp. throughout high schools in all 50 states each October. Students who will be entering college in 1981 should contact their high school counselors and arrange to take the test this October. Semifinalists from this test will be tested again next fall.

For more details regarding the General Dynamics Merit Scholarship Program, obtain a copy of the information booklet from your divisional industrial relations department.

Neil J. Hynes Named New ATC President

Neil J. Hynes

Neil J. Hynes has been named President of American Telecommunications Corp. (ATC). Mr. Hynes previously was Executive Vice President of the telecommunications subsidiary.

Hynes succeeds Henry Marcheschi, who has resigned from ATC to devote the majority of his time to American Telecom, Inc. (ATI), where he serves as Board Chairman and Chief Executive Officer. ATI is a joint venture of American Telecommunications Corp. and Fujitsu Ltd. of Japan. Mr. Marcheschi will also continue to make his experience in telecommunications available as a consultant to ATC and General Dynamics.

Hynes, 44, joined ATC in December 1976 as Vice President - Finance and was named Executive Vice President in October 1978.

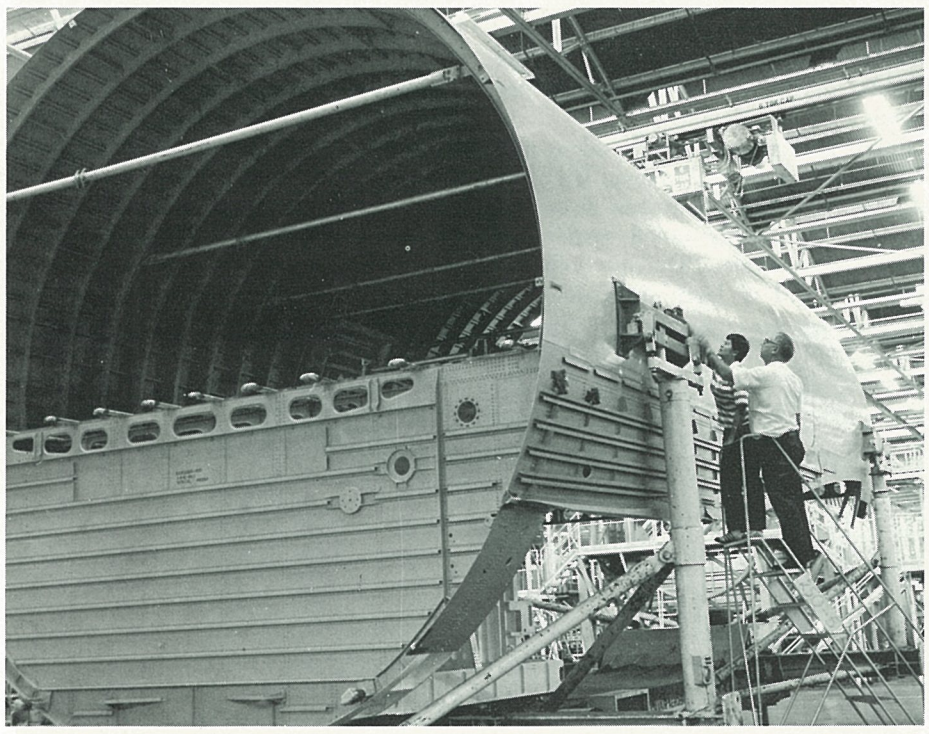
From 1974 to 1976, he was Vice President - Finance of Litronix Corp., Cupertino, Calif., and from 1959 to 1974 he was associated with the Raytheon Corp. At Raytheon, he held a number of increasingly responsible financial and management positions, including Assistant General Manager of the Semiconductor Division, Mountain View, Calif.

A native of Brooklyn, N.Y., Hynes received a Bachelor of Science degree in business administration from Boston College in 1957 and has completed graduate work in business administration at Boston College and San Francisco State University.

Sub Launches Two Tomahawks

Convair-built U.S. Navy Tomahawk cruise missiles were successfully launched August 7th and August 9th from the nuclear attack submarine USS *Guitarro* off the coast of California. They were the fifth and sixth consecutive successful launches of the Tomahawk from a submerged submarine.

First KC-10A Fuselage Is Delivered on Schedule



Readying Fuselage. *Convair employees Vickie Alarid and G. Marx Jr. ready a fuselage section of the KC-10A Extender for delivery to McDonnell Douglas. The KC-10A, the military cargo/tanker version of the DC-10 commercial jet liner, will extend the mobility of U.S. forces on overseas deployment.*

The fuselage of the first U.S. Air Force KC-10A Advanced Tanker/Cargo Aircraft will be delivered by Convair Division this month.

Convair manufactures the three main sections of the KC-10A fuselage under contract to McDonnell Douglas Corp. Convair also manufactures the fuselage for the commercial DC-10 wide-bodied jet liner.

The C/D section, 55 feet long, and the E section, 33 feet long, will be barged to Long Beach from San Diego and delivered on schedule this month. The F/G section will also be delivered this month as scheduled.

When mated, the three KC-10A sections stretch 128 feet. The only noticeable difference between the KC-10A and the DC-10 is that the military aircraft fuselage is windowless.

Recently, the Air Force named the KC-10A the "Extender." Earlier, plans were announced by the Air Force to purchase 20 KC-10As whose primary mission will be to increase the mobility of U.S. Forces in contingency operations. They will also be used to refuel deploying aircraft and carry support equipment and personnel overseas. According to McDonnell Douglas, the Extender's refueling capability nearly doubles the nonstop range of a fully loaded C-5A strategic transport.

The Extender can deliver 200,000 lbs. of fuel 2,200 statute miles or carry a maximum cargo payload of 170,000 lbs. over 4,370 miles.

Through August, Convair has delivered 313 fuselages for the DC-10. The second KC-10A fuselage will be delivered in the first quarter of 1980.

Bombs Away. *Nine 500-lb. Mk-82 bombs are released by an F-16 on a practice bombing mission at Edwards AFB, Calif.*

Convair Service Awards

35 Years

Research and Engineering: T. T. Tanalski.

Contracts: J. E. Miller

30 Years

Operations: A. G. Hedlun, R. F. Graham, G. K. Phares, J. D. Watson.

Quality Assurance: C. E. George, J. Mesa, J. F. DuBois.

25 Years

Operations: C. J. Collins, R. V. Cravo, J. M. Stoffel, J. L. Hopkins, J. L. Flora.

Research and Engineering: H. M. Ikerd, V. J. Park Jr., E. E. Reading, R. A. Clement, W. A. Ziehl.

Marketing: R. A. Johnson.

Quality Assurance: H. J. Winne.

Launch Vehicle Programs: J. E. Garrett.

Finance: F. B. Nichols.

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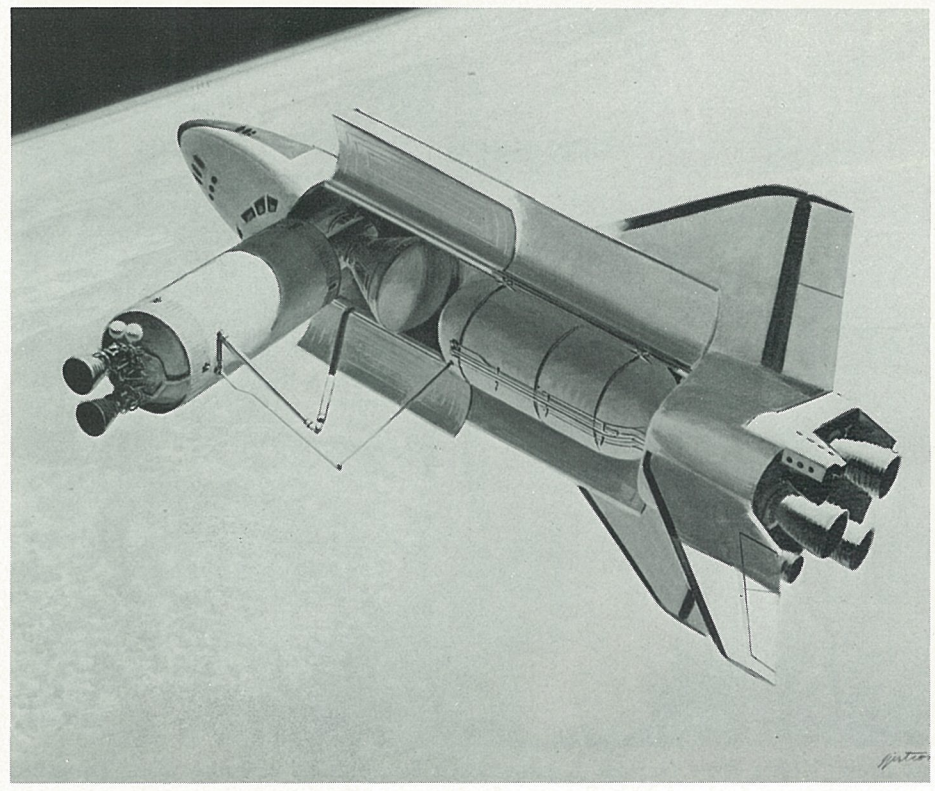
L. Christine Cascella — Associate writer

Jack Isabel, Doug Robertson—Contributing editors, Convair Edition



OTV in Space. *An artist's concept depicts low earth orbit refueling of an Orbital Transfer Vehicle by the Space Shuttle Orbiter.*

Convair Receives Contract To Study Space Vehicles

Convair has received a $370,000 study contract from the National Aeronautics and Space Administration (NASA) to conceptually define Orbital Transfer Vehicles (OTVs). The OTVs would be carried into space by the Space Shuttle Orbiter and then used to deploy manned and unmanned payloads.

The Convair Study Manager is Dan Heald, Chief of Preliminary Design for Advanced Space Programs, which are under the direction of Davey Jones.

Talking about the OTVs, Mr. Heald said, "An early OTV mission might be to transfer, at low acceleration, a large communications platform into geosynchronous orbit. Later, potential missions might include manned sorties to repair or update the platform."

The one-year study will cover OTVs planned for operations in the late 1980s and beyond and is under the direction of NASA's Marshall Space Flight Center.

The study will identify and define candidate OTV concepts and potential evolutionary steps and development approaches that could meet mission requirements for future space transportation.

Use of the Centaur upper stage will be evaluated as a first evolutionary step.

Australian Visitor. *Maurice Neil (center), a member of the Australian Parliament, looks over information on F-16 Avionics Intermediate Shop (AIS) test stations during a recent tour of Electronics Division. Jack Phelan (left), Electronics International Marketing Manager, and Jim Bowen, Electronics Director of F-16 AIS Production Programs, accompanied Mr. Neil during the tour.*

Miyaji Receives ASTM Award

Masanobu C. Miyaji, Senior Chemist in Convair's chemical technology department, has received the American Society for Testing and Materials (ASTM) Award of Merit for outstanding service.

Mr. Miyaji was cited for his "continuous service in promulgating standards for rocket propellants and monitoring contamination of aerospace equipment and fluids." He also was named a Fellow of the Society.

He founded and organized the ASTM subcommittee on propellant technology, which he chaired for 15 years. The committee is credited with developing and producing many ASTM standards that have since become aerospace standards.

Miyaji is the author or coauthor of 15 papers dealing with propellants and contamination and corrosion controls. He is currently working on the compatibility of materials and fuels for the cruise missile.

For You. *Kerry Ann Dailey, 7, presents a bouquet of roses to Mrs. Tamate Ueno, sponsor of the* LNG Taurus *during the ship's naming ceremony on August 4. Kerry is the daughter of Quincy Shipbuilding Painter General Foreman Edward F. Dailey.*

Seventh LNG Tanker Named 'Taurus' at Quincy Shipyard

Naming ceremonies for the *LNG Taurus,* the seventh liquefied natural gas (LNG) tanker to be built by Quincy Shipbuilding Division, were held early this month at the Massachusetts shipyard.

Mrs. Tamate Ueno, wife of Koschichi Ueno, president of the Japanese-Indonesia LNG Co., Ltd., was the sponsor of the ship. Dressed in a blue and white kimono and holding a bouquet of red roses, Mrs. Ueno used a pair of silver scissors to cut a red, white and blue ribbon that sent a bottle of champagne against the gaily decorated bow of the huge tanker.

At the same time, some 12,000 miles away, a sister ship, the *LNG Capricorn,* was taking on the 139th cargo of liquefied gas at Bontang, Indonesia, bound for Japan. *LNG Capricorn,* the third of the Quincy-built tankers, and the five other sister ships on the Japan run, have transported more than 14 million cubic meters of LNG for use by Japanese utilities and industry since beginning service in late 1977. All of the vessels fly the American flag and are manned by American crews.

Mr. Ueno told the large crowd attending the ceremonies that the LNG program involving four nations, Indonesia, Japan, the United States and the United Kingdom, has been quite successful and is helping greatly in supplying the energy needs of his country.

David S. Lewis, General Dynamics Chairman and Chief Executive Officer, told of a recent visit to Indonesia where he had the opportunity to watch the *LNG Leo* take on a load of gas. The loading takes only about 12 hours.

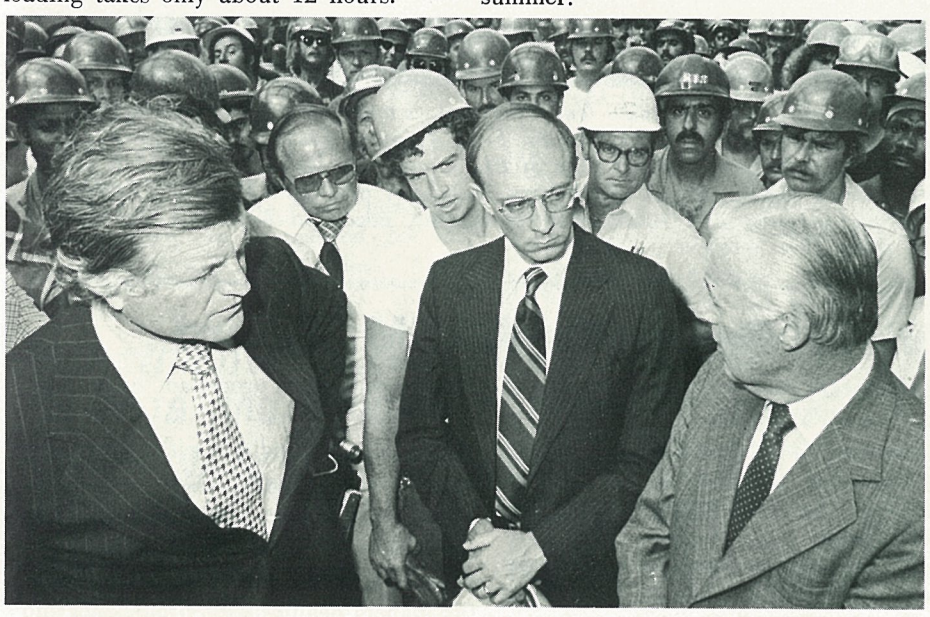
"I spoke with the captain and others in the crew to determine what problems they might be having with the ship and the response in each case was 'none'," Mr. Lewis said, adding that the response was "certainly a tremendous credit to the Quincy shipbuilders."

Massachusetts Gov. Edward J. King said that the *LNG Taurus* is the "seventh of these magnificent ships to be completed at Quincy and other shipyards have not even completed three." The governor said many generations of Massachusetts residents have worked at the shipyard and its success is a credit to the "tremendous management skills and working skills of the people."

P. Takis Veliotis, General Manager of Electric Boat Division and formerly head of the Quincy yard, also praised the Quincy shipbuilding team and said, "*LNG Taurus* is the third gas carrier to be completed in eight months—a record unmatched in the shipbuilding industry."

In welcoming the more than 1,500 guests to the Quincy yard, including employees and their families, Joseph H. Lennox, Quincy General Manager, called the *LNG Taurus* the fastest ship in the LNG fleet and said she had exceeded her contract speed of 20.4 knots by more than one knot during sea trials last month.

The *LNG Taurus* was delivered on August 7 to the United States Trust Company of New York as trustee of a subsidiary of the Bank of America, N.T. & S.A. The ship left Quincy on August 9 to begin gas trials and will enter service on the Indonesia to Japan run later this summer.



Shipyard Visit. *David S. Lewis (right), General Dynamics Chairman and Chief Executive Officer, discusses Quincy Shipbuilding Division's programs with Senator Edward M. Kennedy (left), Democrat of Massachusetts, and R. James Woolsey, Under Secretary of the Navy, during a recent tour of the yard by federal and state officials.*

First Phalanx Delivered

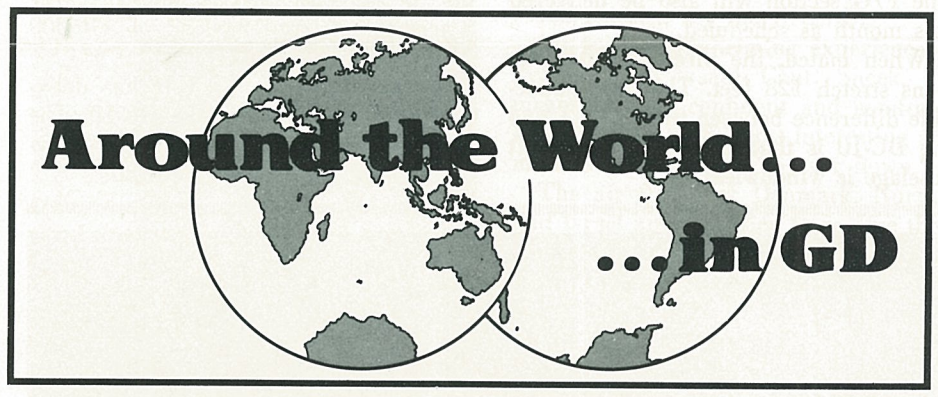
Continued from Page 1

very high firing rates by using a six-barrel Gatling-type gun supplied by General Electric. The gun is electrically controlled, hydraulically driven and is capable of firing 3,000 rounds per minute.

Ralph E. Hawes, Vice President and General Manager of Pomona Division, said that the Phalanx system is one of the most thoroughly tested systems to enter Navy service. "During both development and in later evaluation and operational tests by Navy crews, it hit every target it fired at, including 105 targets towed by aircraft, 11 free flying target drones and four tactical missiles," he said.

Phalanx is easily installed aboard a ship, generally within one or two days following installation of the foundation and pulling of cable between the system and its control panels. Self-contained, Phalanx needs only a 440-volt connection and a hookup to sea water for cooling.

Phalanx Delivery. *The first production unit of the Phalanx close-in gun system is unveiled by James M. Beggs (at podium), GD Executive Vice President - Aerospace, during delivery ceremonies August 9 at Pomona.*



At CHQ: *Billy C. Coleman* transferred from EB as Corporate College Relations Administrator . . . *George D. Owens* joined as Corporate Staff Accountant . . . *James L. Wolbarsht* joined as Corporate Manager of Investment and Acquisition Analysis . . . *Frank M. Timinsky Jr.* joined as Senior Subcontract Auditor.

At Convair: *Christopher J. Cohan* was promoted to Engineering Chief . . . *Robert C. Harbison* was promoted to Engineering Director - Structures and Design.

At Pomona: *John R. Pickering* was promoted to Section Head . . . *H. Lee* transferred from Convair as Factory Manager . . . *Russell J. Thomasson* transferred from St. Louis as Manager, General Accounting . . . *William J. Baldwin* joined as Engineering Specialist.

At Electronics: *D. E. Herbert* transferred from Convair as Engineering Section Head . . . *Franklin L. Pike* transferred from Convair as Manager, Major Subcontracts . . . *Wendell L. Wyly* transferred from Fort Worth as Engineering Manager . . . *G. L. Whaley* was promoted to Director of Contracts . . . *Richard F. Smith* was promoted to Director of Administrative Services.

At DSS: *Max M. Brown* was promoted to Manager DSS Longwood . . . *Glenn G. Rosbrook* was promoted to Manager Technical Services at WDSC . . . *Richard Vertigan* was promoted to Manager, DSS Convair . . . *Richard W. Knudson* was promoted to Manager, Quality Assurance - WDSC.

At Stromberg-Carlson: *Terrance P. McKenna* transferred from St. Louis as Supervisor General Accounting . . . *Frank E. Sharer* joined as DBX Government Programs Manager . . . *Marion Gebhardt* joined as Manager of Training and Management Planning - Tampa . . . *George M. Dellinger* joined as Manager of Market Planning - Tampa . . . *Charles Kautz* joined as Manager of Training and Management Development - Tampa.

At Electric Boat: *Charles J. Henry* joined as Principal Engineer . . . *Thomas E. Kelly* joined as Manager of Labor Relations . . . *Louis Togneri* and *Harold Fink* were selected for an Executive Master of Business Administration Degree Program at the University of New Haven Graduate School and School of Business Administration.

At GDCC: *William E. Schneider* joined as Manager, Management Development . . . *Earl K. Jones* was promoted to Southwestern Regional Operations Manager in Houston . . . *Louis Venezia* transferred from CHQ as Controller . . . *Huey Rodeheaver* joined as Central Area Operations Director.

At Fort Worth: *Kenneth R. Hinman* joined as Marketing Director - Advanced Aircraft Programs . . . *A. R. Haas* transferred from Stromberg-Carlson as Manager, Quality Assurance.

At Freeman United: *Rodney G. Allen* joined as Safety Director.

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Inside the World

Tomahawk Missile Launched Vertically

A U.S. Navy/General Dynamics Tomahawk Cruise Missile made a successful test flight on September 13 after being launched from a ground-based vertical launcher.

All major objectives were met in the test flight, which was the 47th for the Convair-built Tomahawk.

The flight test was made from San Nicholas Island off the coast of California and marked the first time that a Tomahawk had been launched vertically.

Equipped with an antiship missile guidance set with an active radar seeker, the Tomahawk flew a long-range, over-the-horizon, target acquisition flight against a target ship. Following the successful test flight, the missile was parachuted to the ocean surface for recovery.

The September 13 launch was the fifth from a ground platform. Twenty-eight flights have been made after launch from the wing of a Navy A-6 aircraft, 13 from submarines or underwater platforms and one from a ship-motion simulator.

Designed for both land attack and ship attack missions, Tomahawk missiles have accumulated approximately 41 hours of free flight during which they have flown almost 18,000 miles.

Convair is also the prime contractor for the Air Force's Ground Launched Cruise Missile and is also competing for the Air Force's Air Launched Cruise Missile program.

Pioneer Reaches Planet Saturn

The Pioneer 11 spacecraft, launched more than six years ago by a Convair-built Atlas/Centaur, has successfully encountered the giant ringed planet Saturn after a two-billion-mile space odyssey across the solar system.

The spacecraft was launched April 5, 1973, atop Convair's Atlas/Centaur #30 from Cape Canaveral, Fla. The space mission marked the first use of the Centaur D-1A, an improved version of the company's high-energy upper stage booster. Both the first stage Atlas and the Centaur performed flawlessly in placing Pioneer on the proper trajectory, sending it on its way to help unravel the mysteries of Saturn.

Pioneer 11 has taken the first closeup pictures and made the first close measurements of Saturn, its mysterious rings and several of its 10 satellites, including the planet-sized Titan. The spacecraft came through unscathed after making the historic first passage under Saturn's rings and making closeup optical measurements to determine their structure, according to NASA.

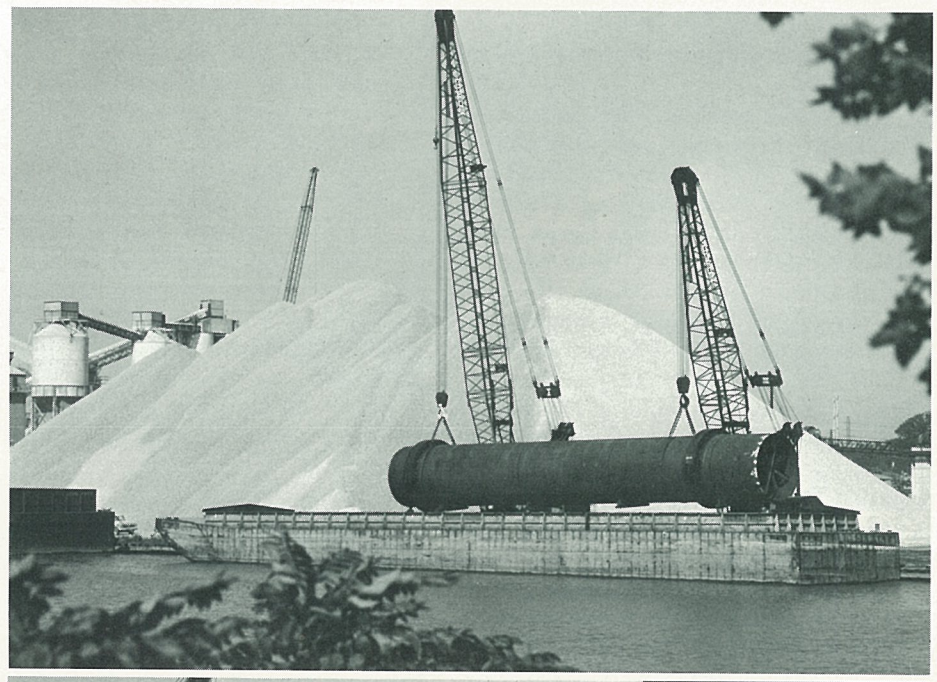
Information returned by the spacecraft, NASA said, is expected to contribute to a better understanding of the origin and evolution of the Sun and planets and provide scientists with a greater knowledge of our own Earth.

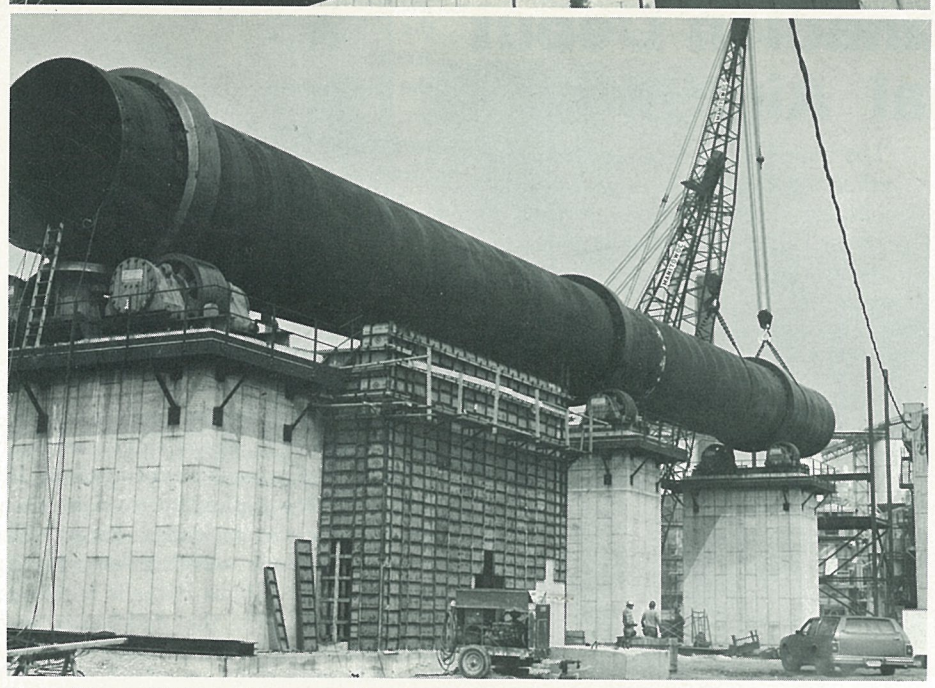
The Saturn encounter concludes a space double for Pioneer spacecraft. Pioneer 10, launched by an Atlas/Centaur in March 1972, set a multitude of records on its historic flyby of the planet Jupiter in December 1973.

Pioneer 10 is now well on its way toward deep space and will become the first manmade object to leave the solar system when it crosses the orbit of Pluto, the outermost planet, in 1987, 15 years after launch. Pioneer 11 will also eventually leave the solar system.

Both Pioneer 10 and 11 carry plaques telling any intelligent species who may one day possibly find them, who sent them and from where.

See Photo Page 3





New Lime Kiln. *The world's largest lime kiln begins to take shape at Marblehead Lime Company's South Chicago plant. From the top, the photo sequence shows the first section, which weighs 220 tons, being barged to the facility; the 140-ton second section being raised into position on its concrete piers; and the first two sections joined in preparation for welding. The completed kiln will have five sections and will be 485 feet long. It will produce 1,500 tons of lime daily — double the plant's present capacity.*

World's Largest Lime Kiln Being Built at Marblehead

Marblehead Lime Co., the nation's largest lime producer, is presently installing the world's largest lime kiln at its South Chicago plant.

The new kiln, a refractory-lined steel cylinder 485 feet long and 14 to 17 feet in diameter, will produce 1,500 tons of lime a day, doubling the present capacity at the plant and increasing the production of lime for the nearby steel industry.

"This new kiln is a monumental breakthrough for Marblehead," said M. James O'Brien, Marblehead's President. "The new kiln will replace two 50-year-old kilns which have only one-third the capacity. This will give us additional capacity to produce lime for Chicago, our principal market."

Mr. O'Brien says the new kiln will cost about $20 million when completed by the middle of next year, including $5.5 million of air pollution control and related equipment.

Lime is one of the oldest products of pyrochemical reaction known to man and has been used extensively in the production of steel to remove impurities and in other chemical processes.

Continued on Page 2

Mexican Airline Orders DC-10s

Aeromexico, the national airline of Mexico, ordered two DC-10 Series 15 airliners from McDonnell Douglas early this month. The aircraft are scheduled for delivery in 1981.

The purchase increases firm orders for DC-10s to 344, with conditional orders and options for 53 more.

Convair Division is a subcontractor to McDonnell Douglas for DC-10 fuselages and has delivered 314 since the start of the program in 1968.

The Aeromexico order is the first for Series 15 aircraft, which are equipped with General Electric CF-6 turbofan engines generating 46,500 pounds of thrust at takeoff, compared to the 41,000-pound-thrust General Electric engines which power DC-10 Series 10 aircraft.

The additional thrust will permit takeoffs from the hot, high-altitude airports in Mexico with more passengers and cargo than a Series 10 version. The new DC-10s will carry 301 passengers.

Major Parts From 4 Nations Mated in F-16

The first F-16 made up of major components from four countries is being assembled at Fort Worth Division.

The single-seat F-16A has a forward fuselage manufactured at Fort Worth; a center fuselage manufactured in the Netherlands by Fokker-VFW; an aft fuselage manufactured by SONACA in Belgium; a pair of wings from SABCA, also in Belgium, and a vertical fin box manufactured in Denmark by Per Udsen.

"There was no major problem putting this plane together from parts that were manufactured thousands of miles apart by people in four different countries who speak four different languages," said William B. Steelman, General Foreman of Mating Wing/Fuselage on the mile-long assembly line at Fort Worth. "The mates all went well — as well as if all the sections had been made right here at Fort Worth."

As a part of the F-16 coproduction agreement with the four European North Atlantic Treaty Organization governments, Fort Worth supplied industry in the participating countries with F-16 plans and the tooling to manufacture F-16 components. Some of the F-16s assembled at Fort Worth will utilize major components manufactured in Europe, and all the F-16s assembled in Europe will use major components manufactured at Fort Worth.

"A person unfamiliar with modern manufacturing methods might marvel at the fact that these parts fit together with no problems," said Mr. Steelman. "But everything has fit well, and there have been no delays or major problems in putting this plane together."

Quincy Is Awarded $24 Million Contract

As *GD World* was going to press, the Department of Defense announced the award of a nearly $24 million fixed price contract to Quincy Shipbuilding Division for drydocking and major overhaul of the USNS *Neptune*, a 370-foot-long Navy ocean cable laying ship.

Work on the ship will begin early in 1980 and is scheduled to be completed in about fourteen months. Several hundred Quincy shipbuilders will be engaged in the overhaul program.

Foushee Named Aircraft VP; Daddi New Director at Convair

The appointment of B. R. Foushee as Vice President and Program Director - Aircraft Programs at General Dynamics Convair Division has been announced by Dr. L. F. Buchanan, Corporate Vice President and Convair General Manager.

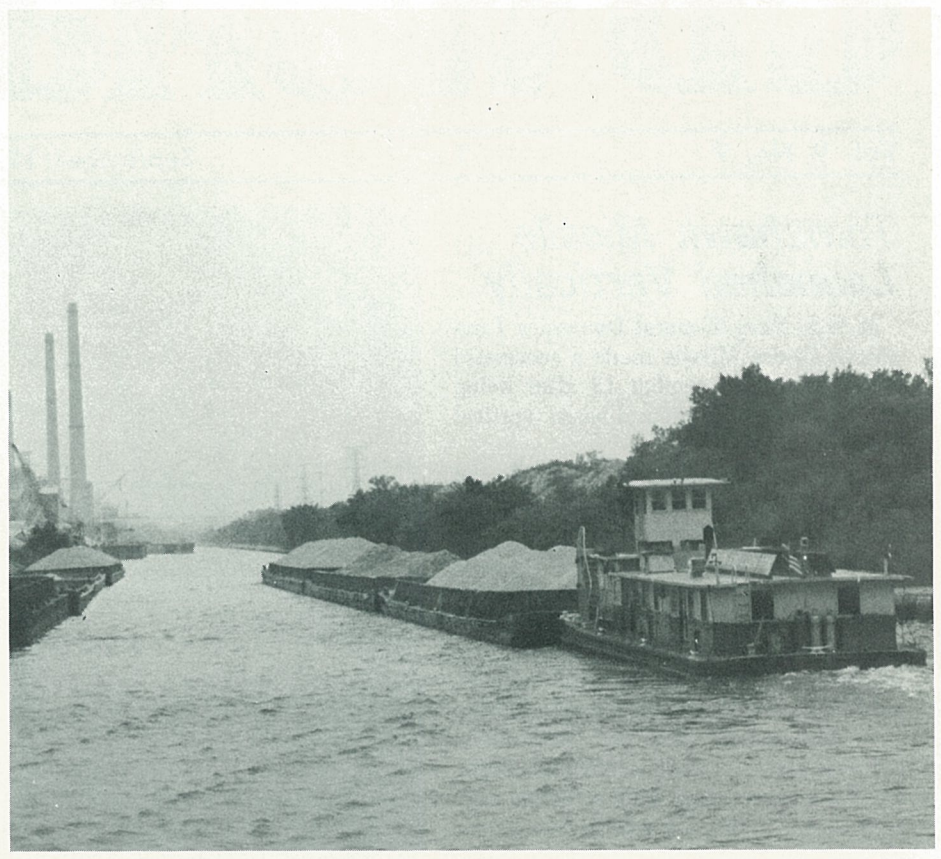
Mr. Foushee will be responsible for the division's DC-10 fuselage program, the Boeing 767 engine strut program, on-going support of Convair-built aircraft, and acquisition and development of new aircraft programs. Foushee, formerly Director of Industrial Relations for Convair, will be succeeded in the industrial relations post by A. B. Daddi, a 27-year veteran of General Dynamics.

Foushee began his General Dynamics career in 1957 as Senior Thermodynamics Engineer in launch vehicle programs. He later held engineering and management positions of increasing importance, including Assistant Project Engineer, Chief of Centaur Systems Engineering, and Deputy Manager - Program Development. He was Centaur Program Manager from 1970 until 1975, when he was named Director of Industrial Relations.

He holds B.A. and M.A. degrees in chemical engineering from Virginia Polytechnic Institute and an MBA degree from Pepperdine University, Malibu, Calif.

Mr. Daddi has been Manager of Management Relations and Professional Placement at Convair. He joined the company in 1952 following a tour of duty with the U.S. Marine Corps. From 1958 to 1960 he was a labor relations representative in San Diego. He later served as an industrial relations analyst for Convair at Vandenberg AFB, Calif., before transferring to the company's Quincy Shipbuilding Division in 1965. He was Manager of Labor Relations and Safety at Quincy from 1970 until 1974 when he returned to Convair and was appointed Manager of Employee Relations.

A native of Brooklyn, N.Y., Daddi earned a Certificate in Industrial Relations in 1959 from the Extension Program at the University of Southern California, Los Angeles, and has completed a number of related courses from other universities.



Pushing Gravel. *Above, Material Service's* Alfred Hagerty, *one of five towboats in the company's river navy, pushes about 4,000 tons of sand, stone and gravel east on the Chicago River to Chicago customers from the Romeoville, Ill., yard home port.*

Quonset Point To Hire 500

Electric Boat Division's Quonset Point, R.I., facility will add 500 production personnel to its work force over the next several months to handle a continually increasing workload. The facility now has 3,800 employees.

Quonset Point fabricates hull sections and cylinders for the U.S. Navy submarines being built at Electric Boat's Groton, Conn., shipyard. The division currently has contracts for 16 fast attack and seven Trident missile-firing submarines.

Thomas A. Sotir, EB's Director of Industrial Relations, said the facility is seeking 400 experienced welders and 100 shipfitters and will also hire some unskilled workers for placement in training programs.

Some of the new employees will eventually work in the new $100 million automated submarine frame and hull cylinder manufacturing facility currently under construction at Quonset Point. The only such complex in the world, when completed next year the automated facility will significantly reduce the time required to produce hull components and at the same time improve quality.

F-16 Makes Canadian Debut At International Air Show

A million Canadians got their first look at the F-16 recently when the multirole fighter made its public debut at the 30th annual Canadian International Air Show in Toronto.

U. S. Air Force Lt. Col. Robert C. Ettinger demonstrated the F-16's low-speed handling characteristics, quick acceleration, tight turning ability and outstanding maneuverability daily during the four-day air show held in conjunction with Canada's century-old annual national fair, the Canadian National Exhibition (CNE).

Nearly 900,000 attended the CNE from August 31 through September 3, the air show dates. It is estimated that several hundred thousand others viewed the air show from areas adjacent to the fairgrounds on Lake Ontario and from boats anchored offshore.

Col. Ettinger director of the F-16 Joint Test Force, flew the two-seat F-16B to Toronto from Edwards AFB, Calif., then put the fighter through its paces daily during six-minute demonstrations over Lake Ontario.

The Canadian International Air Show marked the F-16's first appearance at a public air show in Canada. Earlier this year, an F-16B put on flight demonstrations at three Canadian Forces bases. During that tour, 17 Canadian pilots flew the new multirole fighter.

The F-16 displayed at Toronto recently returned to the U.S. from Europe following four months of joint operations there with aircraft from Norway, Denmark, Germany and Great Britain. Col. Ettinger, who was involved in the European deployment, has logged more than 3,500 flight hours in military aircraft and is one of the select pilots responsible for the development of the F-16 for the U.S. Air Force.

Investment Values Savings and Stock

The General Dynamics Savings and Stock Investment Plan unit values at the end of July are as follows:

Salaried	
Government Bonds	$2.1943
Diversified Portfolio	1.4585
Fixed Income	1.0079*
Hourly	
Government Bonds	2.1947
Diversified Portfolio	1.4922
General Dynamics Stock	$32.25

*Fixed Income was established July 1, 1979, with initial unit value of $1.00.

Kiln Is Being Built

Continued from Page 1

Marblehead produces lime by introducing golf-ball-size limestone in one end of a rotating kiln that is heated to 2,600 degrees Fahrenheit. As the limestone is heated, carbon dioxide is driven off, leaving calcium oxide, commonly called lime.

Marblehead is also installing a new kiln at its dead-burned dolomite producing plant in Utah. When completed late this year, the $3.8 million kiln will supply dead-burned dolomite and steel mill flux materials to steel producers in Utah and other western states.

The company was founded in 1872 in Springfield, Mo., and built a lime plant in South Chicago in 1925. In 1948, the firm was sold to Material Service Corp., which joined General Dynamics in 1959. Marblehead operates 19 lime kilns in Illinois, Utah, Michigan, Indiana and Pennsylvania.

Material Service 'Navy' Carries Sand, Stone on Midwest Rivers

Eight hundred miles from the nearest ocean, GD's Material Service Corp. enjoys the service of its own navy: five towboats, four towboat service craft, 93 barges and 92 crew members who pack sand, stone and other company products off to midwest markets via inland waterways.

Each year, the employees who operate this industrial fleet out of its Romeoville, Ill., home port deliver many million tons of freight to customers in Chicago, Joliet, Peoria, St. Louis and other midwest cities. In Chicago, sand and stone from the Romeoville yard have gone into construction of such famous buildings as the McCormick Place Convention Center, the John Hancock Building and the world's tallest skyscraper, the Sears Tower.

It's no easy life as a crew member on one of these towboats. Everyone, including the master captain, a chief engineer and his assistant oiler, four deckhands and a cook, works six hours on and six off, 21 days at a stretch, until the winter cold freezes out travel.

Away from homes and families, a crew works, eats, sleeps and occasionally relaxes on a narrow towboat about 100 feet long that pushes up to eight times its own length in loaded barges. The average 40-week schedule of runs up and down the Illinois River is no picnic. Before each trip, the deckhands have less than seven hours to make up a tow by strapping the barges together with very heavy steel cables. The final configuration is normally four barges long by three barges wide (900 feet x 105 feet).

The cooks aboard the Material Service boats get a different kind of workout. They have to feed eight to eleven hungry men three times a day, with something left over for late-night snacking.

"If you think it's easy cooking for guys who heave cables and stone around all day, forget it," says Ed Senn, Assistant Marine Manager. Mr. Senn often travels with the crews, most of whom are native Southerners. "These guys work hard. They get steak once a week—about a pound apiece—and everything else from fried chicken, biscuits and gravy, to pan-fried cornbread and home-made pies."

"Believe me, the cooks around here take their jobs seriously," he says. "One of them tried to serve the crew boxed cereal for breakfast and almost got tossed into the Sanitary and Ship Canal—and sanitary it's not."

The towboat pilots, however, probably have the most demanding job of all. High above the tows, they constantly scan the river for possibly dangerous situations.

"Some of the best towboat pilots in the country are probably right here on the Canal," says Chuck Chapin, Marine Manager. They have to be darn good to squeeze those tows through some of the narrow stretches in these rivers."

Marvin Wessell, pilot on Material Service's *Alfred Hagerty*, concurs. "It's just as tough passing another tow," says Mr. Wessell, who adds that it took him a "long, long time" to learn his business. "At some points these rivers are only 160 feet wide. Say you've got a 70-foot-wide tow and a passing tow is just as wide or wider. That doesn't leave you much room to maneuver."

"Some weekend sailors up here don't know a whole lot about the water," adds Wessell. "They don't know whether to pass on the left or right—or what a toot on the whistle means. And they don't know that a moving tow like this needs a minimum of one tow length upstream and two downstream to stop completely."

When the river is empty of other traffic, Wessel relaxes and will even allow a visiting landlubber a hand at the wheel.

"If you keep your eyes on the steering gage needle, you can stay on a straight line," he suggests tactfully.

Wessell then presses a button on the dashboard in front of him and, almost unnoticeably, the pilothouse drops four feet.

"That's so we can fit underneath some of the lower bridges," he explains.

He pushes the button again and the pilot house slides up once more.

"But you can see a lot more of the river from here."

Mesmerized by the steady throbbing of the 510-horsepower diesel engines the visitor suddenly finds the *Alfred Hagerty* headed for the left bank of the Sanitary Ship Canal.

"I think you'd better keep a little to the right," advises Wessell. Then he diplomatically takes the wheel. In one smooth move, he swings the boat from the bank and guides it back on course.

Several of the deckhands laying cable on the deck glance up, puzzled by the boat's unusual maneuverings.

"You're going to hear about this for the rest of the trip," says Senn to Wessell.

"I'm sure," Wessell says, eyes ahead on the river. He smiles.

'Education With Industry' Program Assigns USAF Officers to Convair

Two U.S. Air Force officers reported for duty Sept. 4 at Convair Division for an industrial management course in the Air Force Institute of Technology's "Education With Industry" (EWI) program.

The officers assigned to San Diego for the 10-month course are Maj. Michael DeNigris, from Ramstein Air Base, West Germany, and Capt. Robert Behr from Jessisch Oldendorf Air Station, West Germany.

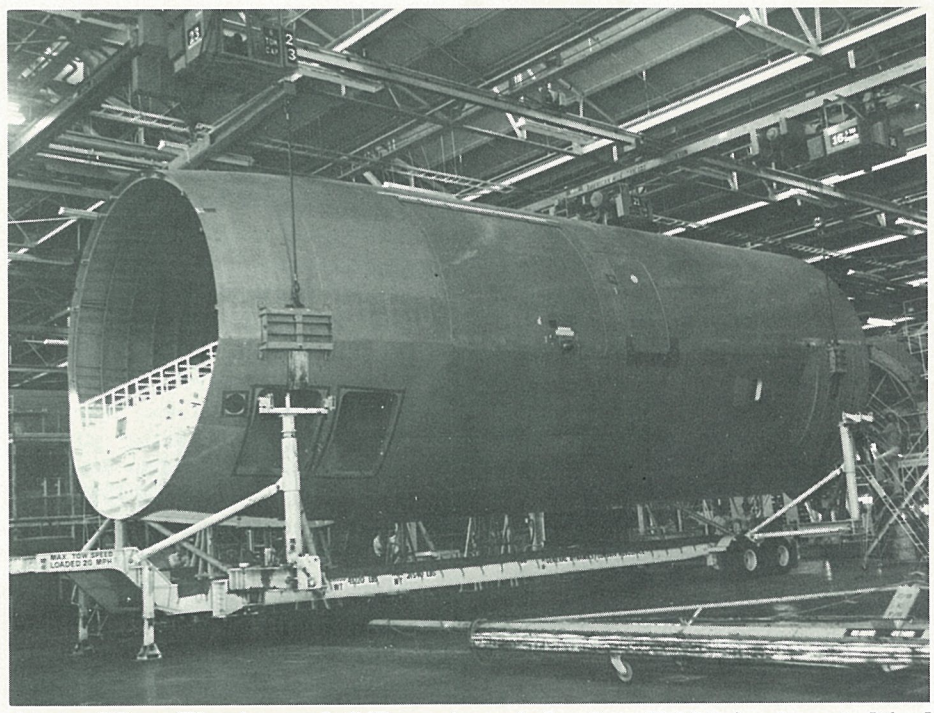
The EWI program is for selected Air Force career officers and is supported by all major aerospace companies. At Convair it is a three-phased program: general orientation, covering organizational structure and product line familiarization; departmental visits and meetings with division management to discuss their functions and responsibilities, and on-the-job assignments with the officers assigned to a host department and having specific job responsibilities.

Maj. DeNigris was Chief—Plans and Programs Branch for the 86th Tactical Fighter Wing at Ramstein. Prior to that he was with Headquarters, Ninth Air Force, at Shaw, S. C. He has also seen duty as Material Air/Ground Controller at March AFB, Calif., and has served as Officer in Charge, Wing Logistics Plans Division, Ellsworth AFB, S. D.

DeNigris entered the Air Force in 1967 following graduation from Manhattan College where he earned a Bachelor of Arts degree in business administration. He received his Master of Arts degree in logistics management in 1972 from the Air Force Institute of Technology School of Systems and Logistic Organization.

Capt. Behr was responsible for financial management of the Air Force's 600th Tactical Control Group at Oldendorf. He previously was assigned to the Air Force's Electronic Systems Division of the Air Force Systems Command at Hanscom AFB, Mass. Behr entered the Air Force following graduation from the University of Notre Dame in 1973, where he received a Bachelor of Arts in business administration. In 1976 he received an MBA degree from Northeastern University in Boston.

This is the 23d consecutive year that Convair has participated in the U.S. Air Force's EWI program.



On its Way. *The forward C/D section of the first KC-10 fuselage is lifted onto its transporter in preparation for shipment to the McDonnell Douglas plant at Long Beach, Calif.*

Convair Delivers First KC-10A Extender Fuselage

The fuselage for the first U.S. Air Force KC-10A Extender advanced tanker/cargo aircraft has been delivered by Convair to McDonnell Douglas in Long Beach, Calif.

Two sections of the 128-foot-long fuselage were loaded aboard a barge at Convair's Harbor Drive facility in San Diego on August 14 and were delivered the following day. The third section, also barged up the Pacific Coast, was delivered August 31.

The barge trip up the coast took approximately 12 hours. After arrival, the fuselage sections, already on their transporters, were towed over the road to the Douglas plant.

Convair manufactures DC-10 fuselages under subcontract to McDonnell Douglas. The Extender is a modification of the commercial DC-10 cargo/freighter. The F/G section of the Extender includes a station for the aerial refueling operator in the aft section of the fuselage. Unlike its commercial counterpart, the Extender is windowless.

According to McDonnell Douglas, the Extender will refuel fighters and simultaneously carry the support equipment and personnel on overseas deployments, refuel strategic airlift aircraft on deployments, and resupply missions and augment current USAF cargo-carrying capability.

The aerial refueling capability of the Extender nearly doubles the nonstop range of a fully loaded C-5A transport. The Air Force has announced plans to purchase 20 Extenders.

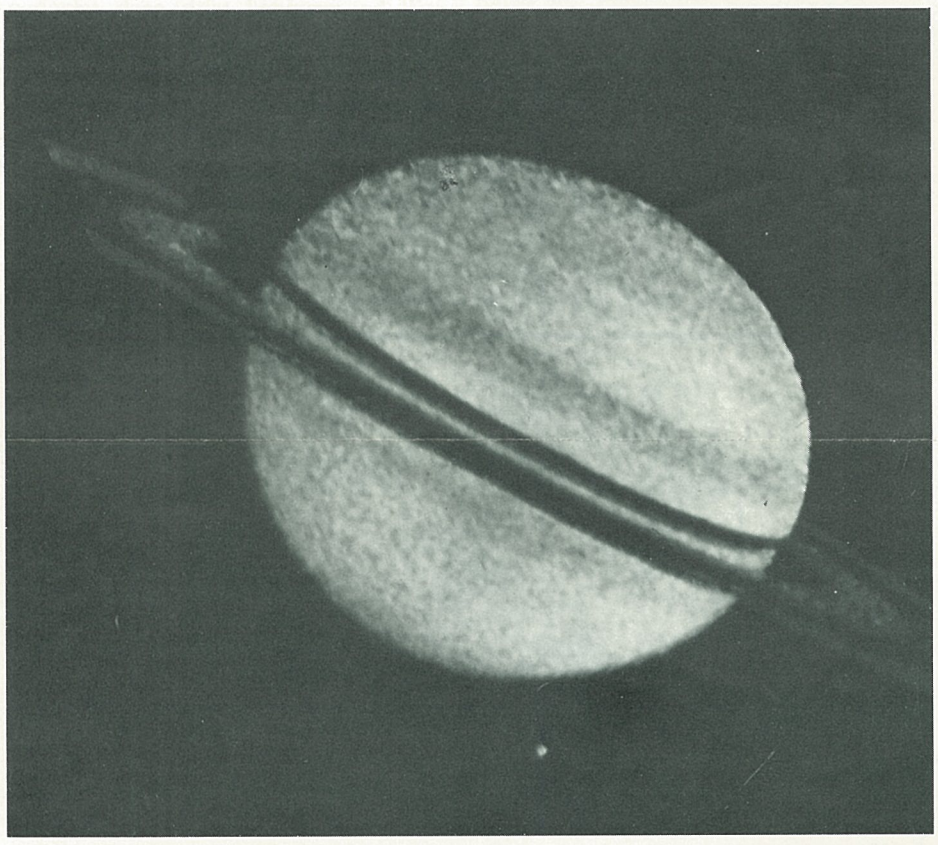
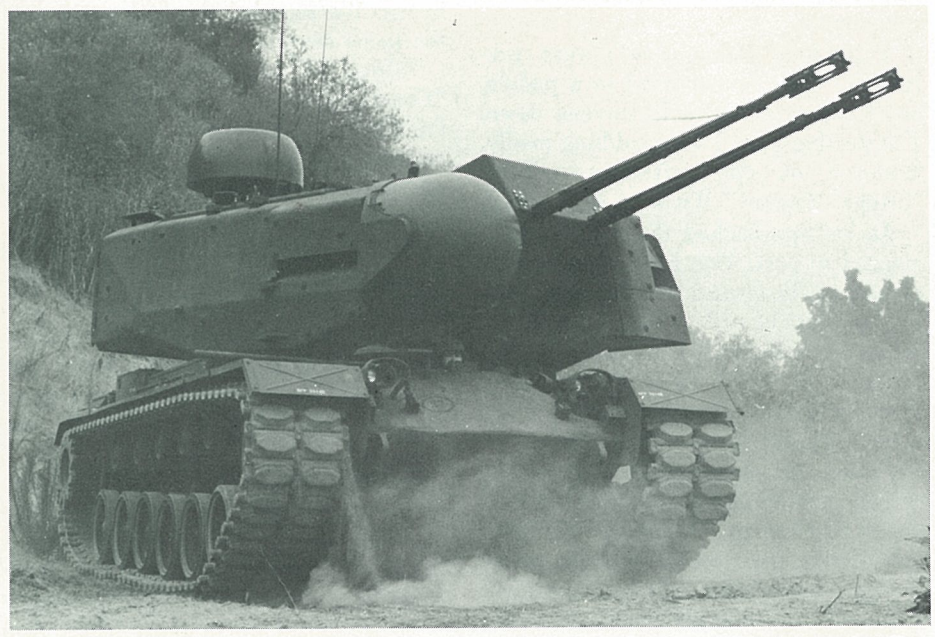


Photo by NASA

Approaching Saturn: *Pioneer closes on Saturn and its rings for a close encounter September 1. The banded structure of Saturn is apparent in this photo taken August 29, 58 hours before Pioneer flies by Saturn and after the billion-mile-plus trip that started from Earth in 1973. Saturn's moon Rhea, seen as a speck of light below the planet, is the sixth moon out from Saturn. It is 1,600 kilometers (1,000 miles) in diameter, about one-half the size of Earth's moon.*



DIVAD Trial Run. *The prototype of the Pomona-designed Division Air Defense Gun System (DIVAD) made its first trial run recently after integration of the turret with an M-48 tank chassis. The Pomona system is being developed for the U.S. Army in competition with one produced by Ford Aerospace. Pomona's design is based on the highly successful Phalanx close-in gun defense system being produced for the U.S. Navy.*

Service Awards

35 Years

Operations: J. D. Jackson, C. O. Byarlay.

30 Years

Operations: L. J. Renz.

25 Years

Marketing: A. W. Spencer.

Industrial Relations: E. C. Patterson.

Operations: C. F. Devin, E. R. Cornell, W. G. Martin, J. E. Luzader, A. S. Stebbins.

Research and Engineering: W. F. Lutes Jr., C. J. Leoni, W. E. Witzell.

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L. Christine Cascella — Associate writer

Jack Isabel, Doug Robertson—Contributing editors, Convair Edition

S-C Catalog Named 'Best in Industry' In North America

The Stromberg-Carlson telephone catalog, which earlier this year won the Printing Industries' Association (PIA) Northeast regional award, has won the National PIA award.

According to Glenn B. Crane, Manager of Marketing Communications, the brochure was one of 25 which won over 2,000 "best-in-industry" entries in its category. The total competition was comprised of 5,000 entries in 12 categories. "We are very pleased," said Mr. Crane. "There was some very stiff competition. We competed against entries from the U.S., Canada, and Mexico."

The 46-page catalog shows all of the telephone products that Stromberg-Carlson produced at its Telephone Systems Center in Charlottesville, Va. The Center produced in excess of one million telephones last year.

Electronics Receives Award For Sparrow From Pomona

Electronics Division has received a supplier award from Pomona Division in recognition of its "outstanding quality achievements" in providing Sparrow AIM-7F missile radomes and housings.

The Superior Performance Supplier Award was presented by Chuck Seeger, Pomona Director of Quality Assurance to Dick Nicholson, Electronics Director of Quality Assurance in ceremonies at the Electronics Division's Lindbergh Field Plant. Electronics is the 16th supplier to receive the award since Pomona initiated the program five years ago.

According to Mr. Nicholson, the receipt of the supplier award is another indication of the effectiveness of interdivisional assistance. "It is a good example of recognizing one division's expertise in specialized areas and applying it to others in meeting cost, schedule, and design commitments to their customers," he said.

Under the guidance of John Dobyne, Tactical Data Systems Program Manager at Electronics, approximately 1,000 radomes and housings for the Pomona-built Sparrows were delivered with zero defects. Electronics will now perform the final customer acceptance in-house, eliminating the need for the Pomona Division to provide source inspection.

DatagraphiX Announces Four New Vice Presidents

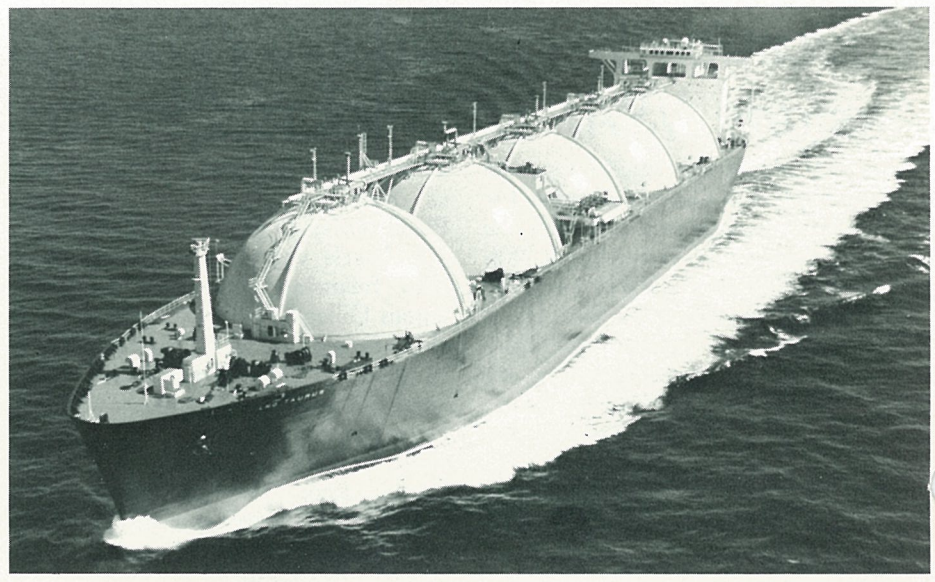
DatagraphiX has announced four executive appointments: William B. Porter was named Vice President-Marketing, Gary F. Johnston was appointed Vice President of Product Operations, Robert W. Walton was named Vice President of Manufacturing and Thomas W. Murrel was named Vice President of Product Service.

Mr Porter, formerly Director of Marketing, will be responsible for all national sales and marketing operations. A graduate of Sam Houston State University, he joined DatagraphiX in 1968 and has held numerous management positions, including Regional Sales Manager, Manager of Marketing Support and Managing Director of European Operations.

Mr. Johnston joined the company in 1970. Prior to his new assignment he served as Plant Manager for Reader Products, Manager of Material and most recently as Director of Material and Plant Services. His new responsibilities include management of materials, product risk planning, reader plant operations, plant engineering and facilities planning. He is a graduate of California State University at Long Beach.

Mr. Walton will be responsible for the management of the company's manufacturing functions. He joined DatagraphiX in 1969 and has held positions in Product Planning and Product Management. He later served as Director of Quality Assurance and was Director of Manufacturing before being named to his present position. Walton was graduated from the University of Illinois and has taken graduate courses at the University of Southern California.

Before being named to his new position, Mr. Murrel was Director of Product Service. He will be responsible for management of product service, logistics, technical support and publications functions. He joined the company in 1970 as Manager of Field Operations and was later promoted to National Service Manager. He is a graduate of the University of San Diego.



Begins Service. *LNG* Taurus, *the seventh liquefied natural gas (LNG) tanker to be built at the Quincy Shipbuilding Division, took on its first cargo of LNG on September 15 at Arun, Indonesia. The* Taurus *joins six sister ships transporting liquefied gas for use by Japanese industry and utilities. Those ships have already delivered more than 14 million cubic meters of LNG to Japan since the first ship, the LNG* Aquarius, *began service in late 1977. The 96,000-ton* Taurus *is shown returning from sea trials in late July.*

Sailor Paddles Rough Waters; Fun And Games On The Thames

By Jim Reyburn

There I was in the #2 starboard position paddling on "The Boat," Electric Boat Division's entry in the Third Annual Flotsam and Jetsam race in the Thames River off New London.

The race was the last of five of the "Fun and Games on The Thames" Day. It was called the Unlimited Category. Any raft that wanted to could enter. What it actually was was a free-for-all, with everybody out to get "Big EB."

Our raft had just won its class, the industrial/military, for the second year in a row, and we were the meanies. Many of the regular crew were exhausted from that race. The word went out for volunteer replacements. I volunteered.

A life-long sailor, I've always preferred a tiller in my hand to a paddle, but I wasn't going to let anyone down. The starting gun! I was paddling madly. Someone on the raft was yelling: "Stroke! Stroke!" We were in the lead.

As we approached the first mark, I glanced to port. Two huge rafts outside of us bore in toward the the mark, trying to cut us off. "Buoy room!" I shouted, vocalizing what you do in that situation if you're in a sailboat race. The trouble was, of course, that this was a raft race. My shout was ignored.

Crash! As the three rafts came together, paddles and oars flailed and loud voices rent the air. One of the offending rafts broke free, scooted outside of us into the lead. "Not very gentlemanly," I thought, as I dug my paddle in again, my right arm beginning to twinge a bit.

"Keep it up!" yelled raft captain Jim Sheridan, "We can catch them!" The other raft in the crash passed us. We should protest, I thought.

On around the second mark and into the third leg. We pulled ahead of one raft. My arm felt worse. Ann Young, #3 starboard paddle, was now getting on my case. "Come on, Jim! Dig in! Go with the man in front of you!"

We rounded the third mark to port. The leader went to starboard. We went inside and he kept clear. Coming out of the turn, we were neck and neck. "We've got them!" someone shouted. My arm felt better. Best of all, Ann had stopped shouting at me.

That euphoric feeling didn't last long. On the fourth leg, two rafts caught up with us. Bow to bow, shouting back and forth, we rounded the fourth mark. Into the fifth leg, a raft came straight at us from the other direction. "How in the . . . . did he get there," I remember thinking as Captain Sheridan jammed "The Boat" hard to port to avoid it.

The other raft, showing its true colors, turned directly into our path. "The Boat" shuddered to a near stop. Pandemonium! Lots of shouting! Feelings of hate! A rival crewman flew backwards, spread-eagled into the water. "Good," I thought. Another leaped off one side as the attacking raft turned over, paddle wheels and all. We were riding right over it.

"Paddle!" yelled "Captain Bligh" Sheridan. "Come on, Jim!" came from behind me. Ann Young again. Three rafts went by the pileup into open water and the last leg. My arm was ready to drop off.

Finally, "The Boat" broke free and began to move faster. Another raft went by us. We rounded the fifth mark into the home stretch.

"Move it!" came from the captain. "Come on Jim!" erupted from my friend in back of me. The adrenalin coursed. My right arm, low on the paddle and pulling like mad, felt strangely serene.

As we screamed over the finish line, a close fourth, the loudspeaker blared: "Titanic, the winner, has been protested by the second place raft. Stand by for the judges' decision!" From the inner reaches of my tired brain came the thought: "Titanic? I thought she sank."

Minutes later, the loudspeaker announced that Titanic had indeed been disqualified. "Serves them right," I thought. "They didn't give us buoy room."

So we ended up in third place. And we also won the prize for the Most Creative Raft.

Great. Give me a sailboat anytime.

New Booklet On COM Available From DatagraphiX

DatagraphiX has published "What's COM?" a booklet describing the fundamentals of computer output microfilm (COM).

Ideal for instructional use within a classroom or office, the free 14-page primer replaces "COM Is," an introduction to COM published previously by DatagraphiX.

"What's COM?" provides an up-to-date overview of computer output microfilm, focusing on its many benefits and applications in the business world. A glossary of COM terminology is included.

"What's COM?" is available by writing to: DatagraphiX, Inc., Marketing Services, P.O. Box 82449, San Diego, Calif. 92138.

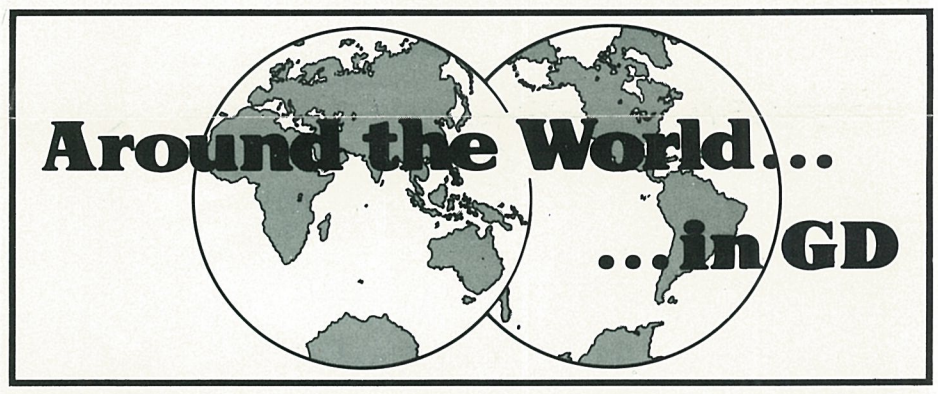
All GD Employees Offered S-C Phones at 40% Discount

All General Dynamics employees will now have the opportunity to purchase telephones from Stromberg-Carlson at a substantial discount from suggested retail list prices.

In this new program, the full range of Stromberg-Carlson phones, wall and desk models with rotary dial or PUSH-PULSE™, will be available at a 40 percent discount from suggested retail list prices, not including applicable state or local sales taxes.

Catalogues, price lists and ordering instructions will be made available to employees through the Industrial Relations Department at each division and subsidiary. Instructions for installation will be provided with each telephone along with Federal Communications Commission rules and regulations for use of personally owned telephones.

Stromberg-Carlson is the leading supplier of telecommunications equipment to the independent telephone industry and produced over 1.4 million telephone instruments in 1978. It has been a subsidiary of General Dynamics since 1955.



At CHQ: *John E. Zimmerman* joined as Corporate Manager of Financial Planning-Commercial . . . *Roy S. Perkins* joined as Internal Auditor . . . *Marlene E. Carver* was promoted to Corporate Manager-International Operations . . . *June M. Henroid* was promoted to Corporate International Representative . . . *Jerome R. Pikulinski* transferred from Fort Worth as Corporate Manager-Manpower Systems & Plans . . . *Lloyd E. Thomas* transferred from Fort Worth as Corporate International Security Administrator . . . *Jennifer J. Wilson* joined as Corporate Tax Administrator.

At DatagraphiX: *Gary S. Grahn* transferred from St. Louis as Manager of Business Systems Planning . . . *Donald Stanley* was appointed Operations Manager-Reader Products.

At GDCC: *Susan E. Kuttner* joined as Sales Training Manager . . . *Willian P. Mack* was promoted to Distributor Program Account Representative . . . *E. Michael Martin* was promoted to Regional Manager in Miami . . . *John D. VerMeulen* was promoted to Southwestern Regional Manager in Houston.

At Electronics: *William W. Breen* joined as Principal Engineer . . . *R. William Church* joined as Program Manager . . . *Bernard G. Kuhn* joined as Engineering Specialist . . . *John G. Manelis* was promoted to Director of Systems Engineering.

At Stromberg-Carlson: *Joseph A. Hartman* transferred from Fort Worth as Director of Technology . . . *James J. Poynter* joined as Manager, DCO Marketing and Sales Support . . . *Paul D. Stapleton* joined as Manager of Software Requirements . . . *Byron W. McPherson* joined as Director of Advanced Programs . . . *Marion Gebhardt* joined as Manager of Business Development Planning - Tampa.

At Convair: *Dennis R. Dunbar* was promoted to Engineering Manager . . . *Dick L. Greer, Allen Vinzant* and *Gordon Place* were promoted to Engineering Chief . . . *Royce B. Riggan* was promoted to Group Engineer . . . *Miles S. Stepich* was promoted to Manager-Manufacturing Control . . . *Charles R. Claysmith, Aladino D. Sorgi* and *Bradley L. Sowers* were promoted to Engineering Chief . . . *Edwin M. Squires* was promoted to Director Industrial Engineering and Master Scheduling.

At Pomona: *Thomas G. Flock* joined as Engineering Specialist . . . *Ronaldo A. Sevilla* joined as Design Specialist . . . *B. E. Franco* was promoted to Deputy Program Director-VIPER Development.

At Fort Worth: *Dale R. Bentrup* was promoted to Assistant Project Engineer . . . *Mike Gordoa Jr.* joined as Engineering Specialist.

At DSS: *James R. Stallard* joined as Professional Development Specialist . . . *R. K. Torrison* was promoted to Chief-DSS at Quonset.

At Freeman United: *John E. Feira* was promoted to Surface Maintenance Manager . . . *Stephen M. Hickman* joined as Property Tax and Title Manager.

GD World

Vol. 9 No. 10 3 October 1979

Inside the World

Astronomical Observatory Boosted to Orbit

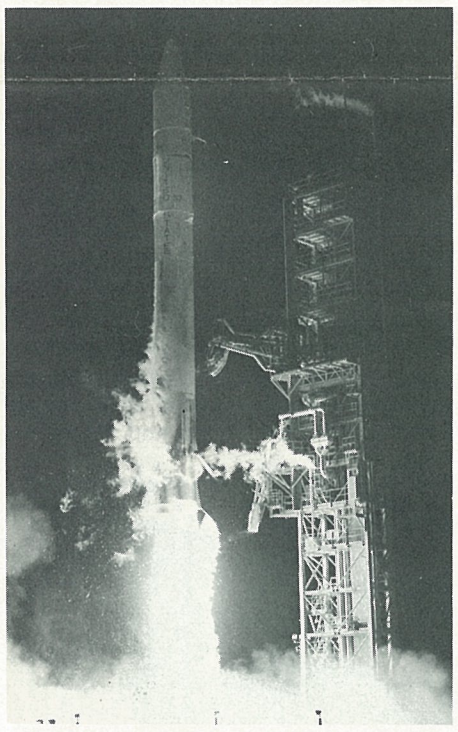
A Convair-built Atlas-Centaur successfully launched the National Aeronautics and Space Administration's (NASA) third High Energy Astronomy Observatory (HEAO) last month from Cape Canaveral, Fla.

Designated HEAO-3, the orbiting observatory is expected to provide scientists with new knowledge of the mysteries of the universe, such as gamma and cosmic rays. The previous HEAOs were boosted by Atlas-Centaur launch combinations in 1977 and 1978.

According to NASA, HEAO-3 is operating satisfactorily, and engineering data are being received and evaluated by ground stations as each instrument aboard the observatory is turned on to low power and checked out.

HEAO-3 carries three experiments, NASA said. One will measure high-energy gamma rays and the other two will study cosmic ray particles—one examining the isotopes of the elements and the other searching for extremely heavy cosmic elements.

An Atlas-Centaur boosted the first HEAO on Aug. 12, 1977. That observatory did an all-sky survey, mapping X-ray sources throughout the celestial sphere. The second HEAO was launched from Cape Canaveral on Nov. 13, 1978, carrying the largest X-ray telescope ever built.



The HEAO Launch

Fighter Evaluation. *General Slay prepares to make his latest F-16 flight at Edwards AFB, Calif., on September 26. Accompanied by Lt. Col. Robert C. Ettinger, Director of the F-16/USAF Joint Test Staff at Edwards, the general flew a one-and-one-half hour evaluation mission.*

Gen. Slay Lauds F-16 Record For Zero-Defect Deliveries

Editor's Note: Air Force General Alton D. Slay, Commander of the Air Force Systems Command, sent David S. Lewis, GD Chairman and Chief Executive Officer, the message reproduced below commending the F-16 Multirole Fighter and the team which designed and built it.

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FM AFSC ANDREWS AFB MD//CC//
TO RUWTAHR/MR DAVID S LEWIS
PRESIDENT & CHIEF EXECUTIVE OFFICER
GENERAL DYNAMICS CORPORATION
PIERRE LACLEDE CENTER
ST LOUIS MO 63105
INFO RUWTNEA/AFPRO GEN DYNAMICS FT WORTH TX//CC//
BT
UNCLAS
DEAR DAVE
I RECEIVED WORD TODAY THAT WE HAVE JUST DELIVERED TWO MORE "ZERO
DEFECTS" F-16S TO THE 388TH WING.  MY COUNTS MAKE THAT 8 OUT OF
36--A GREAT RECORD
BY ANYONES MEASURE, THE F-16 IS A TOP-PERFORMING FIGHTER.  IT IS
VERY GRATIFYING TO ME PERSONALLY AND PROFESSIONALLY TO SEE THAT
THIS TOP-PERFORMING FIGHTER IS BEING BUILT BY A TOP-PERFORMING
INDUSTRIAL TEAM.
PLEASE PASS ALONG MY CONGRATULATIONS AND THANKS TO DICK ADAMS
AND HIS ASSOCIATES.
SIGNED GENERAL ALTON D SLAY, COMMANDER, AIR FORCE SYSTEMS COMMAND
BT
#7151



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FT-RILEY FTRY
GDCDISTOFC STL
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ALCM Makes 4th Flight on Utah Range

The General Dynamics air-launched cruise missile (ALCM) made its fourth flight September 29 in the U.S. Air Force's cruise missile competition, demonstrating its ability to carry out a simulated long-range strategic mission.

"Several firsts were accomplished on this flight," said Bill Dietz, Vice President and Program Director—AGM 109. "It was the longest flight to date and marked the first time our ALCM was recovered in midair by helicopter."

The AGM-109 ALCM was carried aboard a B-52 strategic bomber from the Air Force Flight Test Center at Edwards AFB, and was launched over the Utah Test and Training Range from the left wing pylon of the aircraft.

Moments after release from the pylon, the missile's wings, fins and inlet deployed, the turbofan engine started and the missile began its cruise flight. The ALCM then flew an intricate and varied route using its highly advanced terrain contour matching (TERCOM) guidance system to update and guide its course over the Utah range.

The TERCOM system compares measured terrain heights with heights stored in an on-board computer and corrects the missile's course and altitude based upon the navigation fix obtained. The system enables the missile to achieve unprecedented pinpoint accuracy by guiding it to designated geographic target locations.

"Hard work by the entire ALCM team at San Diego and Edwards has given us a good start in the cruise missile competition," Mr. Dietz said. "I urge everyone connected with the program to continue their best effort through the remaining months of the competition to demonstrate the performance and capability of our ALCM."

Last month's test was the third successful flight of an AGM-109. On one other previous flight, an ALCM was successfully launched from a B-52 wing pylon, but encountered difficulties shortly after launch and did not attain its test objectives. In four flights thus far, the AGM-109 has been launched twice from the B-52 wing pylon and twice from the rotary launcher in the bomb bay.

The ALCM, built by Convair Division, made its first flight in July to initiate the flyoff competition with a cruise missile built by Boeing. The ALCM flyoff, which includes 10 flights by each company's missiles,will continue throughout 1979. The winning airframe manufacturer is expected to be selected to begin production in early 1980.

The General Dynamics ALCM is 20 feet long and 21 inches in diameter with a deployed wing span of 8 feet, 7 inches. It has a range of more than 1,500 miles and cruises at very low altitudes at speeds of more than 500 miles per hour.

With modifications, a B-52G strategic bomber will be capable of carrying a weapons load of 20 AGM-109s—six on each wing pylon and eight in a rotary launcher in the aircraft's bomb bay.

Convair has been developing cruise missiles since the early 1970s to provide an attack capability against targets on land or sea. In addition to the ALCM, a ground-launched cruise missile, designated BGM-109, is currently in full-scale development at Convair for the Air Force.

United Way Contributions Help Your Communities

For many years, General Dynamics employees have supported the largest not-for-profit organization in the world—the United Way. The United Way allocates funds to a broad range of local community groups and organizations through volunteer citizens within the community.

Last year, GD's total employee pledges amounted to more than $2.25 million. In 1979, GD is again asking for employee support in the local United Way drives, whether your contributions go directly to the United Way or to organizations, such as Electric Boat's Employees' Community Services Association, that will distribute funds to the United Way. United Way contributions will go to about 37,000 human services groups and agencies across the country.

Your dollars will fund the organizations in your communities that provide support for recreational and health agencies and youth and family services. Specifically, some of these agencies are the American Red Cross, the American Diabetes Association, the Arthritis Foundation, Boy and Girl Scouts and others.

"United Way has proven that it effectively services the local communities," said Ron Beatty, Corporate Manager, Industrial Security, who heads up this year's United Way Campaign at GD. "An average of 89 percent of every dollar goes to vital health and welfare agencies which help people in your community."

Local and independent United Ways—of which there are more than 2,200 in the United States — are made up mostly of volunteers who not only raise money for the community, but plan for future community needs.

Basic criteria are used by volunteers to evaluate agencies seeking United Way support. The agency must:

- Be an incorporated tax-exempt charitable organization according to the Internal Revenue Service,
- Have financial records and procedures audited annually by an independent public accountant,
- Be governed by a local board of volunteers,
- Publish an annual report containing audited, year-end financial statements prepared in accordance with generally accepted accounting principles,
- Provide a human care service meeting an important need in the community and
- Operate at a reasonable cost in relation to income.

Since 1887, United Way has proven that local citizens can choose for themselves the organizations that will benefit the most from their contributions, because the volunteers serve as directors legally responsible for the allocations and all related affairs.

"Your money will be well-managed and used if you give the United Way," said Mr. Beatty. "It provides a very real function in your community."

Management Interns. *General Dynamics Management Interns will be assigned for three months to each of the aerospace divisions and at corporate headquarters during the next 15 months. The interns are, left to right: Philip J. Poehlman, who represents St. Louis, Michael D. Davis, from Fort Worth Division, James R. Dawson, Electronics, Louis P. Eidenmiller, Convair and Ned Howell, Pomona Division.*

Five Aerospace Engineers Named to Intern Program

Five General Dynamics engineers have been selected for the company's 15-month Aerospace Management Intern program. The five selectees will take on three-month assignments at each of the four aerospace divisions and at corporate headquarters.

Michael Davis, James Dawson, Louis Eidenmiller, Ned Howell and Philip Poehlman were selected for the GD program. They will work at a different department in each division to gain an understanding of the company's operations.

The objective of the aerospace management intern program, according to Jay Colvin, Corporate Manager of Personnel Placement, is to provide developmental experience for qualified people who have high levels of management potential.

"This program will advance each individual toward higher-level responsibilities, progressing from divisional manufacturing management through full division or corporate management," said Mr. Colvin.

"What's more, it will develop management depth and flexibility in the areas of engineering and program management, contracts, finance, operations, industrial relations and other administrative and operational functions," he said.

Mr. Davis, Fort Worth Operations Analyst, Life Cycle Cost, received a Bachelor of Science degree in aerospace engineering at the University of Illinois and a Master of Science degree at Carnegie-Mellon, Pittsburgh.

Mr. Dawson, Electronics Senior Engineer, F-16 AIS Program Office, received Bachelor of Science and Master of Business Administration degrees from Cal Poly, San Luis Obispo.

Mr. Eidenmiller, Convair Operations Project Representative, Cruise Missile Final Assembly, joined Convair from Cal Poly in San Luis Obispo, where he earned a Bachelor of Science degree in mechanical engineering in 1975. He is presently working on his Master of Business Administration degree at San Diego State University. Since joining the company, he has worked in structural design, in the machine shop and in Tomahawk Final Assembly.

Mr. Howell, Manufacturing Engineer at Pomona, Operations Resource Group, joined the division in 1977. He received a Bachelor of Science degree in aerospace engineering from Iowa State University and a Master of Science degree in Operations Research from the University of California at Berkeley.

Mr. Poehlman, Convair Project Engineer-Tomahawk Sub-Ship Program, was selected by the Corporate Office as its at-large representative in the program. He is a 1970 graduate of the United States Naval Academy, Annapolis, Md., and joined Convair in January 1977 after completing his military duty and earning a master's degree in applied mechanics at the University of California at San Diego.

Oestricher, Ettinger Ranked As Year's Top Test Pilots

Fort Worth's Philip F. Oestricher, the first pilot to fly the F-16, and U.S. Air Force Lt. Col. Robert C. Ettinger, Director of the F-16 Joint Test Force at Edwards AFB, Calif., have been named America's top test pilots for 1979 by their peers, the members of the Society of Experimental Test Pilots (SETP).

Mr. Oestricher and Col. Ettinger accepted the Iven C. Kincheloe Award, symbolic of their prestigious honor, at the SETP's recent 23d annual awards dinner in Los Angeles.

Philip F. Oestricher

Lt. Col. Robert C. Ettinger

"Phil and Bob were honored for their work in the F-16 high angle-of-attack test program concluded at Edwards in July," said Neil R. Anderson, Fort Worth's Director of Flight Test.

That test program, in which Oestricher and Col. Ettinger were the project pilots, was structured to prove the F-16's stability during maneuvers at slow speeds and high angles of attack.

The F-16 was specifically designed to enable a pilot to fly the aircraft to its full potential while keeping his eyes on his objective without fear of loss of control or damaging the airframe through overstress. This F-16 feature is made possible by the aircraft's electronic, computer-directed flight control system, which can be programmed to prevent a pilot intent on mastering an adversary from pushing the fighter past its safe operating limits.

The test was designed to determine the maximum performance a military pilot can demand from the F-16.

Oestricher makes an analogy with cornering tests for the quick-response steering on a new sports car: "The objective is to determine precisely how tight the driver can turn before the car starts drifting off the road and control is lost," he explained. "You try practically impossible turns to get the proper fix on the moment control begins to ebb, then you make steering geometry changes to give maximum response with minimum danger.

"By contrast, to change the F-16's limiter system we revise an electronic circuit board in the flight control computer."

Oestricher and Col. Ettinger point out that a share of the Kincheloe Award belongs to the dozens of General Dynamics and Air Force engineers and flight operations technicians who supported the high angle-of-attack test program.

The Kincheloe Award is the culmination of many years of pioneering F-16 Program work for the two test pilots. Oestricher was the first test pilot assigned to the F-16 Program during its prototype phase in 1972, was the first to fly the YF-16 prototype aircraft in February 1974 and later became the first pilot to fly the aircraft supersonic. Because of his intimate connection with the program over the years, Oestricher has contributed a number of ideas eventually incorporated into the F-16.

Col. Ettinger, a veteran of more than 3,500 flight hours in military aircraft, has made similarly important contributions as one of the select pilots responsible for the development of the F-16 for the U.S. Air Force and allied air forces.

Colombia Awards Stromberg 1,000-Line DCO Contract

Stromberg-Carlson has been awarded a contract for a 1,000-line digital central office (DCO) to be installed in Colombia, South America.

The DCO has been sold to E-Systems, Inc., TelSatCom Division, Dallas, Tex., which will furnish the switch to Empresa Nacional de Telecomunicaciones, the Colombian company that operates the national network in that country.

Stromberg-Carlson's Digital Switching System will interface with the E-System's satellite earth station of the National Telecommunications network in addition to providing local telephone service to the Colombian mountain city of Leticia.

Investment Values Savings and Stock

The General Dynamics Savings and Stock Investment Plan unit values at the end of August are as follows:

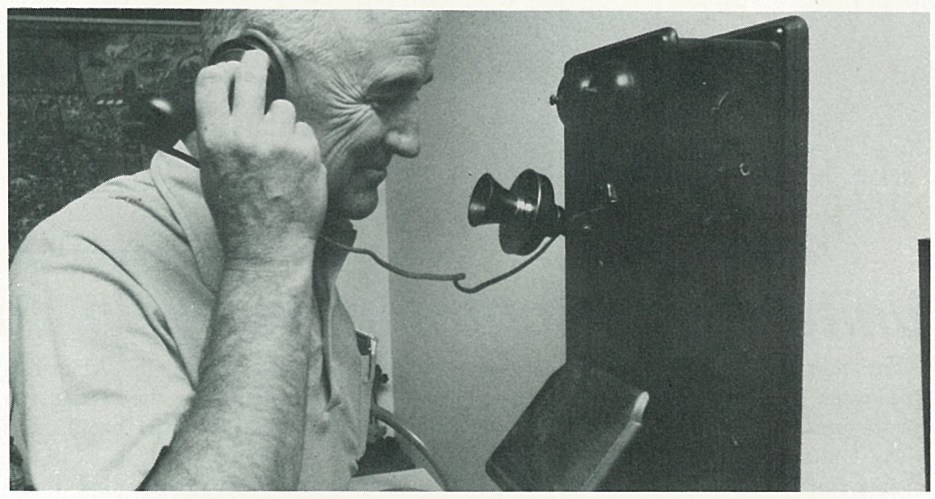
Salaried:	
Government Bonds	$2.2061
Diversified Portfolio	1.5515
Fixed Income*	1.0158
Hourly:	
Government Bonds	2.2063
Diversified Portfolio	1.5872
General Dynamics Stock	41.875

*Fixed Income was established July 1, 1979, with an initial unit value of $1.00.

Dividends Declared

At its October meeting, General Dynamics Board of Directors declared regular quarterly dividends of 30 cents per share on GD common stock and $1.0625 per share on its Series A preferred stock.

Dividends will be payable on Nov. 19, 1979 on the common stock and on Nov. 15, 1979 on the preferred stock. The record date for both classes of stock is October 19.



Back in Service. *Donald Henderson of Albuquerque, N.M., restored this 1918 Stromberg-Carlson telephone after contacting the company to obtain information on the necessary rewiring.*

A Letter to Stromberg-Carlson Helps Man Restore 1918 Phone

In the 1930s, Donald Henderson and his family moved to a farm near Albuquerque, N.M., that was equipped with a battery-powered 1918 Stromberg-Carlson telephone.

"It was the only telephone in the area at that time," he recalled recently, "and anyone wanting to use it had to walk at least a mile each way to do so."

Over the years, Mr. Henderson, now 54, kept the old telephone with him, and recently he wrote to Stromberg-Carlson seeking help in restoring his 1918 model. His request was referred to Kal Howard at S-C's Telephone Systems Center in Charlottesville, Va. Mr. Howard sent Henderson a sketch of the wiring that he could use in refurbishing the telephone and connecting it to the modern telephone network.

A month later, Henderson reported that "the old phone is back in operation" and is proudly displayed on a wall of his present office in Albuquerque.

Dr. J. P. Waszczak to Participate In Federal Executive Exchange

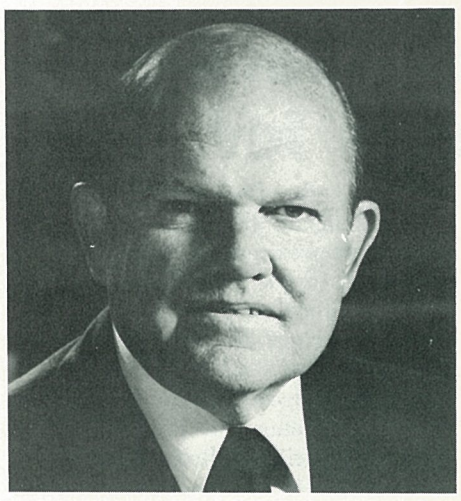
Dr. John P. Waszczak, Convair Division Program Manager for the Stanford Superconducting Magnet, has been given a year's leave of absence to participate in the President's Executive Exchange Program.

This federal program, begun in 1969, is an exchange of executives between industry and agencies of the Federal Government.

In nominating Dr. Waszczak, Dr. L. F. Buchanan, General Manager of Convair Division, said, "His managerial and technical competence is recognized by his superiors, peers and subordinates. The opportunity to learn about the Federal system and how it is managed will be an outstanding growth opportunity. We also know that he will make a substantial contribution to the agency or department to which he may be assigned."

Waszczak will spend his year in Washington assisting the Deputy Undersecretary of Transportation in the organization and management of the Department of Transportation's research and development program.

Waszczak joined General Dynamics in June 1966 and worked at Fort Worth Division until the spring of 1973, when he returned to Carnegie-Mellon University Pittsburgh, to obtain his doctorate in mechanical engineering. He then came to Convair as Program Manager with key assignments in structural analysis and energy systems.



Sam E. Keith

Bryan L. Murphy

Fort Worth's Keith, Murphy Honored by AF Association

Two veteran General Dynamics executives were singled out for national recognition during opening ceremonies last month for the annual national convention of the Air Force Association (AFA) in Washington, D.C.

Sam E. Keith, Jr., Fort Worth Manager of Plant Engineering and a veteran of 38 years with General Dynamics, was awarded the AFA's Presidential Citation. Mr. Keith, who has been active in AFA for 15 years, is a permanent member of the AFA board and formerly served as Texas AFA President and Southwest Regional Vice President. He was formerly honored with three other national AFA awards: the Medal of Merit, the Exceptional Service Award and the National AFA man of the year (1968).

Bryan L. Murphy, Chief, Fort Worth Management Systems/Procedures and a veteran of 24 years with General Dynamics, was awarded the Exceptional Service Award at the ceremonies in the nation's capital. Mr. Murphy has been involved in AFA since 1972 and currently is president of the Fort Worth AFA chapter.

Building Zero Defect F-16s Results From Maintaining High Standards

Fort Worth's repeated delivery of Zero Defect F-16s to the U.S. Air Force has brought special praise from the commander of the Air Force Systems Command (See Story Page 1). It is praise earned through the division's high standards of design, manufacturing, assembly and inspection of thousands of components of each multirole fighter, according to L. M. Pisz, Manager of Field Operations/Quality Control.

Mr. Pisz says that every single one of the thousands of components on an aircraft which the Air Force inspects prior to accepting it must be functioning properly for the plane to earn the Zero Defect title. "Air Force inspectors do not tiptoe lightly through their receiving inspections," Pisz says. "They remove each of the fighters' 228 access panels and poke their noses into every nook and cranny of the aircraft."

The Air Force categorizes discrepancies as critical, major or minor; none of the 36 F-16s delivered to the Air Force so far had critical discrepancies and eight have had Zero Defects.

Convair Service Awards

35 Years

Operations: A. M. Lintvedt, F. Jenkins.

30 Years

Operations: M. V. Archibeque, C. A. McGraw, G. Grande, R. S. Mendoza.

Data Systems Services: M. R. Binion.

25 Years

Operations: W. K. Woods, H. E. Baxter, P. P. Sawtell, R. C. Hinck, R. T. Collins.

Research and Engineering: D. R. Lukens, H. R. Horne, B. R. Zillgitt, P. Genser.

Marketing: N. J. Rutherford.

Quality Assurance: J. E. Vondracek.

GD World

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G. Alexander Smith — Manager of internal communication

L. Christine Cascella — Associate writer

Jack Isabel, Charles Brown — Contributing editors, Convair Edition

Photo by William Mitchell

Winning Idea. *Ben Bensen, a graphic artist at Pomona, looks over the security poster titled "Don't Turn Your Back on Classified" that won first place in a national industrial security poster competition.*

Pomona Artists Design Posters Winning National Recognition

A Pomona Division-designed poster, titled "Don't Turn Your Back on Classified," was named the best Industrial Security Poster in the United States by the American Society for Industrial Security at its annual meeting in Detroit.

The winning poster was one of four entered in national competition by Pomona; another Pomona entry, "Heard Any Security Leaks Lately?", won an honorable mention.

Ben Bensen, a graphic artist, designed the winning poster, and Ginny Morris, also a graphic artist, designed the honorable mention poster.

According to Don Harris, Security Officer at Pomona, the posters are part of the continuing Security Awareness Education program at the division.

Rebuilding Expressway. *Material Service is supplying base stone, concrete aggregates and cement for a $113 million project of the Edens Expressway between Chicago and the North Shore communities. Funded by the Illinois Department of Transportation, the project will rebuild the 13-mile, six-lane expressway by October 1980.*

GD Will Use Space Satellites To Transmit Data Coast to Coast

General Dynamics' Data Systems Services (DSS) has activated two earth stations to transmit and receive data via satellite between its offices in California and Connecticut.

The satellite service, called Satellite Data Exchange, is provided by American Satellite Corp. through earth stations located at the Western Data Systems Center in San Diego and the Eastern Data Systems Center in Norwich, Conn.

"The stations on both coasts went on-line last month and are now fully operational," Mel Indyk, DSS Technical Services Specialist, said. "They form the springboard of a planned four-station network that will link all of the DSS data centers," he continued.

Mr. Indyk pointed out that transmitting data via satellite will eliminate use of land-line transmission between data centers and provide for a more reliable, economical and speedier method of data transfer. He said substituting satellite channels for land lines will considerably increase data transfer efficiency between data centers.

DSS will use the wide-band satellite data channels for weekly payroll preparation, master scheduling and automated planning control functions, as well as many other data processing tasks. One designated data center accessing the satellite will be able to perform certain corporate-wide data processing functions, eliminating redundant capability at several locations.

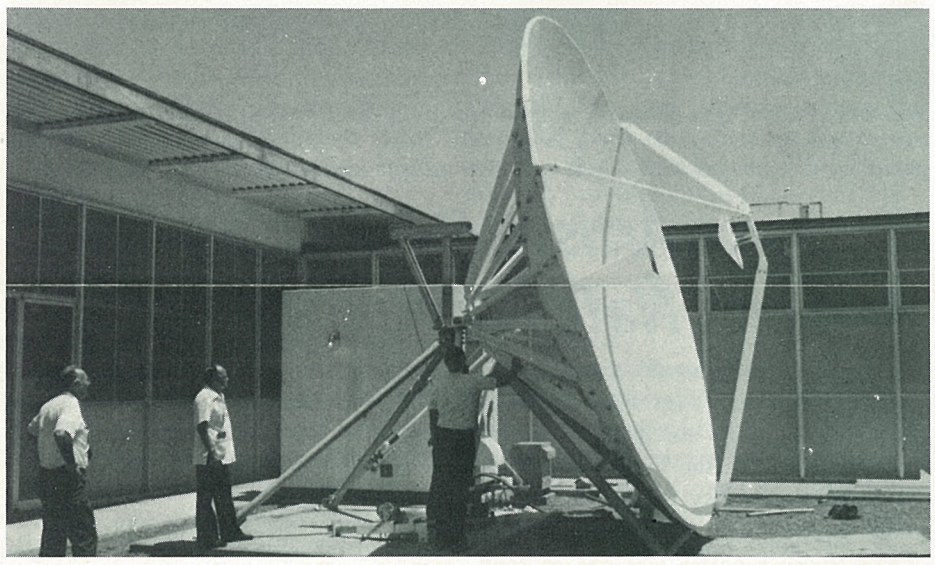
According to Bob Rafaels, Director of Marketing Services for American Satellite, the satellite channels provide DSS with circuits that improve data transfer efficiency.

"During a comparison test, identical data were sent over the American Satellite network and the best available ground circuits," he said. "While the conventional transmission took 22.8 seconds, the satellite channel transferred the same data in 13.0 seconds," Mr. Rafaels said.

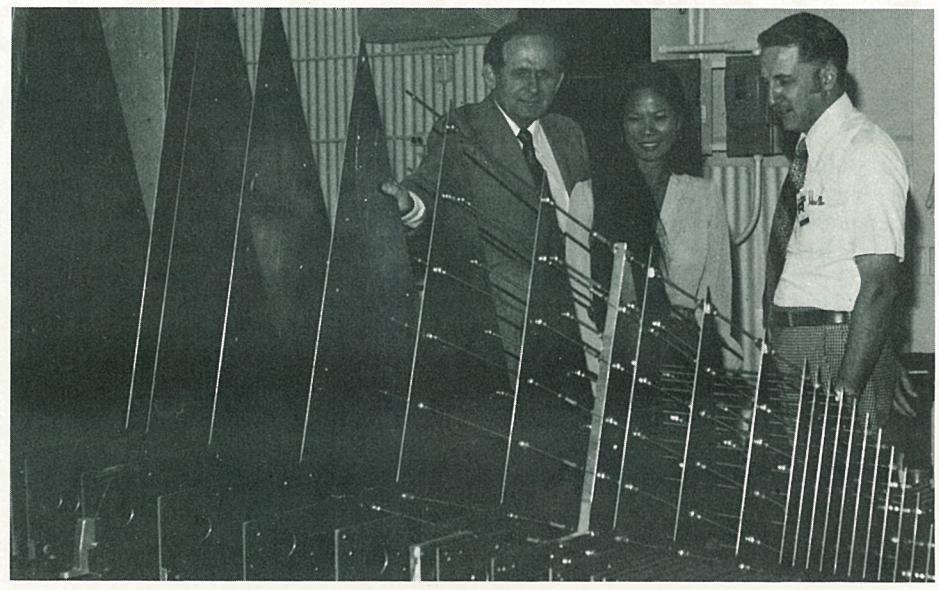
Privacy of all data transmission is secure and protected by data encoding and decoding equipment, and the system is designed to operate with an accuracy of no more than one error in 10 million transmitted bits.

Each earth station consists of a 16-foot diameter dish antenna pointed at a satellite 22,300 miles in space and a small walk-in electronics shelter. The stations send and receive data in the form of electronic pulses which are exchanged at a rate of 56,000 pulses per second.

Indyk said the third station in the DSS satellite network will be operational by year-end at the Central Data Systems Center in Fort Worth. The fourth station is expected to go on-line next year in Sanford, Fla.



Data Communicator. *GD's Data Systems Services is using two earth stations like this one to send and receive business data from California to Connecticut.*



Master Model. *Joe Penner (left), Convair's 767 Program Manager, looks over the aft underwing engine strut fairing master model for Pratt & Whitney-powered 767 aircraft with Eva Asuncion, 767 Program office, and Marion Choate, Boeing's Resident Manager. Fabrication of 767 engine struts is under way at Convair.*

Convair Begins Fabrication On Engine Struts for 767

Convair Division has begun fabrication of engine struts for the Boeing 767 commercial twin-jet aircraft, the first of a new family of airliners for short, medium and long ranges.

The division received a multimillion dollar contract earlier this year to provide engine struts for 400 of the new-generation wide-bodied passenger jetliners.

"Tool design, tool manufacturing and initial parts fabrication are already under way at the Lindbergh Field Plant," said Joe Penner, Program Manager. Delivery of the first strut, a test vehicle which will be used for fit checks, is scheduled for June 1980. Other test articles will be manufactured and delivered to Boeing for static and fatigue testing, ground tests and engine calibration.

"The first production flight article," Mr. Penner said, "is slated for delivery in December 1980."

Each of the Boeing-designed engine struts is about 25 feet in length and weighs approximately 1,200 pounds. The main torque box is made of steel with aluminum skins, while the aft and forward fairings are made of composite materials. The strut configurations are designed to accommodate turbofan engines manufactured by Pratt & Whitney, General Electric and Rolls Royce.

According to Boeing Commercial Airplane Co., United Airlines, American Airlines and Delta Air Lines have already placed orders for the 767. Deliveries are scheduled to begin in 1982. General Electric engines will power the American and Delta 767s; United's will be powered by Pratt & Whitney engines. In addition, two Canadian airlines—Pacific Western and Air Canada—have also ordered Pratt & Whitney powered 767s.

GD's ALCM, F-16 Displayed At Air Force Assn. Meeting

Hundreds of military and government officials attending the Air Force Association's 1979 National Convention in Washington, D.C., were given briefings and demonstrations on the F-16 Multirole Fighter and the AGM-109 air launched cruise missile (ALCM) last month.

The General Dynamics display included a cockpit mockup of the F-16 which demonstrated the U.S. Air Force's newest fighter's capability by allowing visitors to the exhibit to "fly" the aircraft electronically and to track and engage targets displayed on a large screen in front of the cockpit.

In addition, a Convair-built ALCM was on display to provide guests with first-hand knowledge of the various components of the highly accurate, subsonic strategic missile.

The annual AFA convention, held this year September 16 to 20 at the Sheraton-Park Hotel, is the most important showcase for military aerospace products, and it gives aerospace firms the opportunity to brief their customers—the Air Force and the government officials—on the status of major programs.

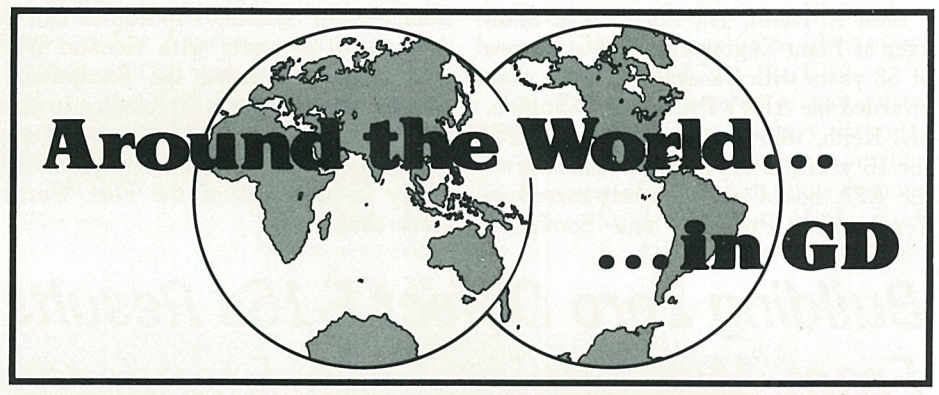
The corporation used a 14-by-16-foot room located directly above the exhibit hall to house the equipment which controlled the F-16 demonstration. The nerve center, which contained computers, power supplies and related equipment trucked from Fort Worth, was connected to the exhibit through an eight-inch hole cut through the floor of the room above the exhibit.

Two separate systems enabled the nerve center to effectively simulate an F-16 combat mission. One computer generated basic flight instrument readings such as airspeed, altitude and heading and projected them onto the guest pilot's headup display. A second computer produced an image on a screen in front of the cockpit so the pilot could see the runway, the horizon and air and ground targets. Together, the two systems allowed a pilot to simulate taking off, flying, engaging targets and landing the F-16.

EB Awarded Study Of Ocean Pressure

Electric Boat has been awarded a $13.2 million research and development contract by the U.S. Navy.

The contract includes studying the effects of pressure on submarine components at deep operating depths.



At CHQ: *Dean W. Olney* transferred from WDSC as Corporate Manager-Financial Systems Analysis . . . *Clifford E. Puckett* transferred from Stromberg-Carlson as Corporate Director-Manpower Programs and Communications.

At Convair: *Ralph C. Posey* was promoted to Chief-Industrial Engineering . . . *Joseph Stelmah* transferred from Pomona as Director-Cruise Missile Production . . . *Michael J. Yokota* was promoted to Chief-Manufacturing Technology . . . *Charles A. Brown* joined as Corporate News & Information Specialist, Sr., Western Region.

At ATC: *Richard E. Bloem* was named Manager, Corporate Procurement . . . *Clifford W. Licko* was named Manager Manufacturing at the Telephone Division . . . *Val H. Robinson* was promoted to Manager, Quality Control at the Telephone Division.

At Asbestos: *Victor Altmejd* joined as Director of Marketing . . . *Gilles L. Dumas* joined as Sales Director.

At Material Service: *Walter D. Serwa* was promoted to Controller . . . *William P. Tomy* was promoted to Director of Data Systems Services . . . *Donald E. Stewart* was promoted to Vice President of Purchasing.

At Groton: *John P. Leming* was promoted to Chief of Engineering . . . *Paul W. Risseeuw* was promoted to Ship Manager.

At Quincy: *John E. Fogarty* transferred from EB as Director of Industrial Relations.

At Electronics: *L. R. Carroll* transferred from Pomona as Program Manager.

At Quonset Point: *Leo A. Sullivan* transferred from Pomona as Manager of Manufacturing.

At Pomona: *H. Hamamoto* was promoted to Assistant Director, Area Defense Missile Systems.

At Fort Worth: *Billy J. Sprague* was promoted to Assistant Project Engineer . . . *Winton B. Zimmerman* was promoted to Manager-Field Service Support.

At Stromberg-Carlson: *David L. Hinshaw* was promoted to Director, DCO Program.

At Freeman United: *Dan R. Wild* joined as Assistant Superintendent—Fidelity Mine.

At Marblehead Lime: *William B. Haubold* was promoted to Treasurer.

At DatagraphiX: *Jeffrey A. Smith* joined as Assistant General Counsel.

GD World

Vol. 9 No. 11 November 1979

Third Quarter Earnings Set Record

General Dynamics announced on November 1 that its earnings for the third quarter of 1979 were a record $50.1 million, or $1.86 per common share.

This compared with earnings in the third quarter of 1978 of $39.8 million, or $1.50 per share, which included 39 cents per share attributable to an investment tax credit resulting from the delivery of a liquefied natural gas (LNG) tanker owned by a wholly owned finance subsidiary and a loss of 9 cents per share resulting from foreign currency translations.

Sales Increase 27 Percent

Sales for the third quarter of 1979 were $1.1 billion, up 27 percent over the $836 million reported in the same period a year earlier.

Earnings for the first nine months of 1979 were a record $127.4 million, or $4.71 per share. Earnings from operations in the first nine months of 1978 were $90.3 million, or $3.39 per share, including the 39-cent LNG tanker investment tax credit and before considerations of the net loss of $186.7 million, or $6.99 per share, resulting from the June 1978 settlement with the U.S. Navy to cover cost overruns on submarine construction contracts at Electric Boat Division.

After giving effect to the Navy settlement, GD reported a net loss of $96.4 million, or $3.60 per share, for the nine-month period in 1978.

Sales for the first nine months of 1979 were a record $2.97 billion, a 29 percent increase over the $2.31 billion recorded for the same period of 1978.

All 1978 per share figures have been adjusted to reflect the 2-1/2 for 1 stock split which was effective Jan. 19, 1979.

Funded Backlog at $9.9 Billion

Funded backlog at the end of the third quarter was $9.9 billion, up 22 percent over the $8.1 billion reported a year earlier. Funded and unfunded backlog was $11.7 billion compared with $9.8 billion at the end of the third quarter of 1978.

David S. Lewis, Chairman and Chief Executive Officer, said that the excellent third quarter results reflected continuing strong performances by almost every operating component of the company.

The Fort Worth and Convair divisions led the aerospace group with substantial gains in both sales and earnings, Lewis said.

Fort Worth continued its on-time, on-cost performance on the important F-16 fighter program.

"Sixty-nine of these high-performance fighters have now been delivered to the Air Forces of the United States, Belgium and the Netherlands and we are forecasting on-schedule deliveries of the first F-16s to the Air Forces of Denmark, Norway and Israel early next year," Lewis said.

Convair's air-launched cruise missile (ALCM) has now made five of its 10 scheduled flights in the flyoff competition against an ALCM built by Boeing.

"The performance of the Convair ALCMs met all test goals on four of the five flights, with one of the five being unsuccessful. The Convair ALCMs have logged more than 12 flight hours and flown more than 5,400 miles," Lewis said. "This important competition will continue throughout the remainder of 1979, and the winner of the production contract is expected to be selected in the first quarter of 1980."

Meanwhile, full-scale development work is continuing at Convair on the Navy's sea-launched and the Air Force's ground-launched cruise missile programs.

"Earnings were down at the Pomona Division in the third quarter as a result of a decision to increase research and development effort on several programs having great potential for the future," Lewis said, but noted that "sales were up sharply at the division and the prospects for increased earnings at Pomona are exceptionally bright."

Continued on Page 2

100th System Century DCO Represents Another Milestone

Stromberg-Carlson's 100th System Century® Digital Central Office (DCO) has been delivered to Cranes Mill, Tex., for the Guadalupe Valley Telephone Cooperative, Inc.

The 3,800-line DCO is equipped with 11 Digital Satellite Units which will serve outlying area residents for Guadalupe Valley.

The delivery in early November represents another milestone of technological achievement for Stromberg-Carlson in the digital telecommunications industry.

Traditionally, mechanical switching equipment dominated the telephone industry, and the number and speed of calls transmitted over a pair of wires were very limited. With the introduction of System Century digital switching equipment, a single transmission path, or pair of wires, can carry hundreds of telephone messages simultaneously. A voice signal entering the switching system is divided into millions of information bits which are interwoven with other incoming information and are transmitted to their destination at the speed of light.

At the receiving end, the computer-controlled system unscrambles each message in the proper sequence for delivery.

Stromberg-Carlson engineers began developing a family of digital switching equipment in 1971, and the first of these systems -- a 500-line DCO -- was delivered to Coastal Utilities, Inc., Richmond Hill, Ga., in 1977. By the time the first DCO was delivered, more than 30 independent telephone companies across the country had signed letters of intent to purchase System Century DCOs.

System Century DCOs contain two call processing units, each with its own computer memory. If one unit should fail, the call would be transferred without interruption to the second system.

In the first quarter of 1979, custom calling, call accounting and other features were introduced and included in the DCO, features which Stromberg-Carlson introduced ahead of its digital competitors.

System Century DCOs have been delivered and turned over at a record pace -- the company shipped 29 systems in the first six months of this year, exceeding total shipments for all of 1978.

In April of this year alone, nine systems were placed into service, seven more than were ever put into service before in a month's time.

Stromberg-Carlson recently cut over the largest Class 5 DCO in the United States. The 5,000-line system was purchased by the Western Reserve Telephone Co., in Hudson, Ohio, and will be expanded to a 7,500-line system by the end of 1980.

Another significant accomplishment took place in August 1979, when Stromberg-Carlson achieved the telephone industry's first synchronized digital switch-to-digital switch connection. Contracted by the Canby Telephone Company in Canby, Ore., the DCO switch operates synchronously with a Bell ESS-4 digital switch through a carrier line in Portland, Ore.

1st F-16 Arrives At MacDill AFB

The first of more than 100 F-16 Multirole Fighters scheduled to be based at MacDill AFB, Fla., was greeted on its arrival at the base on October 22 by a crowd of more than a thousand.

The two-seat fighter, dubbed 'Suncoast 1', was flown from Fort Worth to the base near Tampa by Col. Henry D. Canterbury, Commander of the 56th Tactical Fighter Wing. The aircraft will be assigned to the 61st Tactical Fighter Squadron. During the next few months, Suncoast 1 will be used for maintenance familiarization training prior to the beginning of F-16 operations at MacDill early next year.

The F-16 replaces the F-4 Phantom at MacDill. The base will now specialize in training F-16 pilots and maintenance crews for the Air Force.

Hill AFB, Utah, was the first air base to operate F-16s and is the site of the Ogden Air Logistics Center which provides logistical support worldwide for the F-16 program.

Submarine Launches Tomahawk

A Convair-built Tomahawk sea-launched cruise missile (SLCM) made a successful test flight on November 7 after launch from a torpedo tube of the attack submarine USS *Guitarro* (SSN665).

This was the 14th underwater launch of a Tomahawk and the 48th test flight for the versatile missile, which has also been launched from aircraft, land platforms and a ship motion simulator.

According to U.S. Navy and Convair program officials, all major objectives were met in the test mission, which ended with parachute recovery of the missile at San Clemente Island. The Tomahawk was returned to Convair for refurbishment and will be flown again in the SLCM full-scale development program.

Designed for both land-attack and ship-attack missions, Tomahawks have flown for more than 41 hours during their test missions. The 20-foot-long, 21-inch-diameter sea-launched cruise missiles fly at speeds in excess of 500 miles per hour and have a range of 1,500 miles.

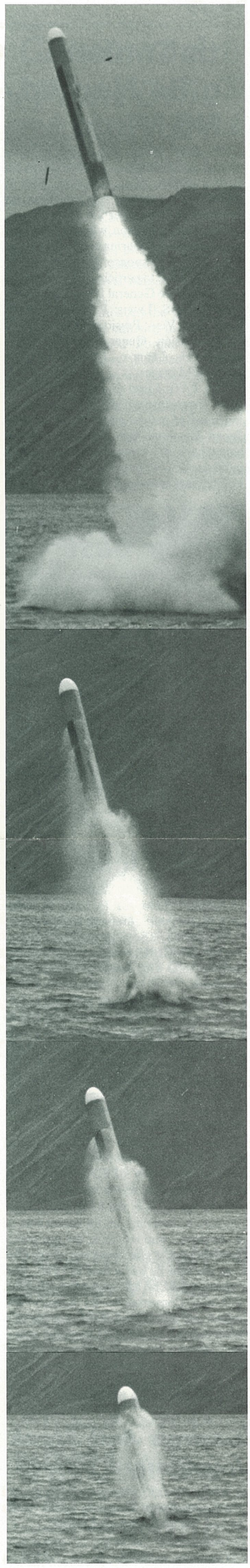
EB To Update Control System On Trident Subs

Electric Boat has been awarded a $63.5 million contract for engineering, integration and technical support of the command and control system (CCS) on Trident submarines.

The contract involves updating, integrating and testing CCS computer hard- and software for the follow-on Tridents. CCS work will be performed at the Land-based Evaluation Facility at the Naval Underwater Systems Center in Newport, R.I.

EB was prime contractor for the CCS system for the lead ship in the Trident class, the *Ohio* (SSBN726). That system was certified 26 days ahead of schedule earlier this year by the Naval Sea Systems Command.

The Trident's CCS is the first to control navigation, command, communications, sonar, defensive weapons and ship control systems from a central computer bank. It is the largest use of digital computers ever undertaken by the Navy for submarines.



From the Depths. *Trailing flame and smoke from its boost motor, a Convair-built Tomahawk sea-launched cruise missile roars out of the Pacific Ocean after being launched from the USS* Guitarro *on November 7.*

8th Tanker To Be Named LNG Virgo

The *LNG Virgo,* the eighth liquefied natural gas (LNG) tanker to be built by the Quincy Shipbuilding Division, will be named during formal ceremonies at the shipyard on November 28.

Mrs. Stanley Wilson, wife of a Managing Director of the Burmah Oil Company, Ltd., will be the sponsor for the new ship. Also scheduled to participate in the naming ceremonies are General Dynamics' Chairman David S. Lewis; P. Takis Veliotis, Corporate Vice President and Electric Boat Division General Manager; and Joseph H. Lennox, Quincy Division General Manager.

The *LNG Virgo* is scheduled to join seven sister ships which have been delivering liquefied natural gas from Indonesia to Japan for more than two years. Those ships have delivered nearly 19 million cubic meters of LNG to Japan for use by utilities and industries.

F-111s Deploy To Far East

Six U.S. Air Force/General Dynamics F-111D fighter-bombers recently completed a successful deployment to the Far East.

The aircraft, assigned to the 27th Tactical Fighter Wing at Cannon AFB, N.M., flew to Australia via Hickham AFB, Hawaii, in early October. By the end of October, the six F-111s had completed an extraordinary total of 106 sorties from the Royal Australian Air Force's Amberley Base.

The Cannon-based F-111Ds moved on to Taegu, South Korea, for joint operations with U.S. Air Force and Korean Air Force units prior to returning to New Mexico.

SSIP Helps Protect Against Inflation

One of the best ways for General Dynamics employees to build financial security for their retirement is through use of the company's Savings and Stock Investment Plan (SSIP), according to Warren G. Sullivan, GD Vice President of Industrial Relations.

"Economic projections indicate that inflation will be with us for a long time to come," Sullivan says. "Employees who want to build a secure future for themselves when they retire should remember that each dollar they invest in SSIP, coupled with company contributions, will build up a nest egg which is sheltered from Federal income taxes."

More than 32,000 GD salaried and hourly domestic employees are participating in the company's SSIPs. The original salaried plan was set up in 1965.

To illustrate how the SSIP can help at retirement, Sullivan cites the recent case of an employee who retired at the age of 62. He had left his contributions in the plan from the time he had joined in 1965, and, when he retired, his account had accumulated $50,000. Converted to an annuity this would pay him about $500 per month. When added to his total monthly retirement and his Social Security benefits of $850, he would then have an annual total retirement income of $16,500 per year -- equal to his income before he retired.

Savings And Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of September are as follows:

Salaried	
Government Bonds	$2.2214
Diversified Portfolio	1.5843
Fixed Income	1.0235
Hourly	
Government Bonds	2.2216
Diversified Portfolio	1.6204
General Dynamics Stock	44.75

Phalanx Shipped. *Pomona's Phalanx, Unit 2, was recently packaged and trucked to the Dam Neck Fleet Training Center in Virginia Beach, Va., where it will be installed to train Navy personnel in Phalanx' operation and maintenance.*

First Phalanx Gun System Is Delivered to U.S. Navy

The Fleet Combat Direction Systems Training Center, Dam Neck, at Virginia Beach, Va., has become the first U.S. Navy facility to receive Pomona's Phalanx, an automatically controlled gun system for close-in ship defense. The Phalanx will be used to train Navy personnel in the system's operation and maintenance.

Additional Phalanx systems are scheduled to be delivered to training facilities at the Fleet Training Center, San Diego, and at the Service Schools Command, Naval Training Center, Great Lakes, Ill.

The Navy has said it plans to place Phalanx systems aboard 240 vessels ranging from aircraft carriers to patrol boats.

Phalanx is one of the most thoroughly tested systems to enter service in the Navy. During development and later in evaluation and operational tests by Navy crews, Phalanx hit every target it fired at, including 105 targets towed by aircraft, 11 free-flying drones and four tactical missiles.

Convair's ALCM Makes Fifth Flight in DOD Competition

On October 29, a Convair-built AGM-109 missile successfully completed the fifth in the series of 10 scheduled flights in the air-launched cruise missile competition being conducted by the Department of Defense.

The missile was launched from the bomb bay rotary rack of a B-52 bomber flying over the Utah Test and Training Range. As in previous tests, the missile was navigated by a Terrain Contour Matching guidance system which periodically updates the flight path and altitude by comparing terrain heights against stored data in an on-board computer. The system guides the missile with unprecedented accuracy.

The flight concluded with a preprogrammed maneuver to deliberately impact the missile on the range just as it would in attacking a target.

The Convair AGM-109 is competing against a Boeing missile for selection as the U.S. Air Force's air-launched cruise missile. In the five flights so far in the competition, the Convair missiles have accumulated more than 12 flight hours, during which they have flown more than 5,400 miles.

Editor's Note: As *GD World* was going to press, a sixth AGM-109, launched by a B-52 over the Pacific Ocean, experienced difficulties shortly after launch and did not complete its mission.

3d Quarter Earnings Set Record

Continued from Page 1

The division passed a major milestone during the quarter with the delivery to the U.S. Navy of the first Phalanx close-in gun defense system. The Navy plans to install the Phalanx on more than 240 ships, and several allied countries have indicated interest in equipping their navies with this highly advanced and extremely effective weapon system.

Earnings at the marine divisions, Electric Boat and Quincy Shipbuilding, increased over last year's third quarter, Lewis said.

Electric Boat's performance is continuing to improve on the SSN 688-class attack submarine program since the claims settlement last year. "At the same time, excellent progress is being made on the high-priority Trident ballistic missile submarine program," Lewis said.

The Quincy shipyard delivered its seventh LNG tanker, the *LNG Taurus,* in August and is scheduled to deliver one more this year.

Sales and earnings were up at Electronics Division and at the telecommunications and data products subsidiaries -- Stromberg-Carlson, American Telecommunications Corporation, General Dynamics Communications Company and DatagraphiX, Inc.

With the exception of Freeman United Coal Mining Company, the resources subsidiaries -- Material Service Corporation, Marblehead Lime and Asbestos Corporation -- all showed increased earnings in the third quarter of 1979.

"The performance at Material Service was especially noteworthy," Lewis said, "with very significant increases in sales and earnings."

At Freeman United, performance was down from 1978 third-quarter levels, primarily due to wildcat strikes, however, results for the first nine months showed increases in both sales and earnings over last year, he said.

The company's Canadian subsidiary, Asbestos Corporation Limited (ACL), continues to operate under the threat of expropriation by the government of Quebec. ACL has filed suit questioning the constitutionality of the Quebec expropriation law and that case is now scheduled to be heard early next year.

Eight F-16s Fly In AF's Red Flag Desert Exercise

The first F-16s assigned to participate in the Tactical Air Command's (TAC) Red Flag training program completed their two-week mission with flying colors.

Eight F-16s from the Multinational Operational Test and Evaluation (MOT&E) force based at Hill AFB, Utah, flew more than 70 sorties during Red Flag exercises at Nellis AFB, Nev., in September.

Maj. Mike Nelson, MOT&E Operations Officer, said the F-16s flew "mostly what has been programmed in the future for the F-16 -- that's interdiction and close-air support and air superiority." Maj. Nelson noted that the F-16s flew at speeds of more than 600 miles per hour just 100 feet off the ground on some missions and at other times teamed with other aircraft to combat aggressor air forces.

'Deadly Duo'

The major said the F-16 combined with the F-15 to form a "deadly duo" against larger numbers of F-5 aggressor aircraft which simulated the tactics of potential enemy forces.

Red Flag simulates a realistic combat environment for training Air Force pilots. On gunnery and bombing ranges north of Nellis, mock targets dot the desert, protected by simulated Warsaw Pact radars, antiaircraft gun batteries, surface-to-air missile systems and patrols of aggressor aircraft.

Combat Training

The exercise is based on the belief that the more combat experience aircrews accumulate, the better their chances of survival in the event of actual combat.

According to *Air Force Magazine,* "TAC's goal is aircrew survival beyond the critical, high-loss-rate first 10 missions of a war . . . The objective is to save aircrews and airframes by skilled performance earned through an intense realistic training program."

In each day of Red Flag activity, the Blue Force, made up of fighters, bombers, reconnaissance and electronic countermeasures and airlift aircraft, "attacks" an objective in the desert that is defended by the Red Forces simulated surface-to-air threats and the aggressor aircraft.

Experiences Discussed

After each day's operation, the Blue and Red Force aircrews meet to discuss their experiences.

F-16 flight crews and maintenance personnel from the U.S., Belgium, Denmark, the Netherlands and Norway supported the F-16 operations.

Maj. Nelson said the F-16s achieved an average sortie rate of one flight per aircraft per day during the first week of the exercise and an average sortie rate of 1.25 flights per aircraft per day during the second week.

System Century DCO Ordered for Guam

The Guam Telephone Authority has awarded Stromberg-Carlson a $2.4 million contract to install a System Century® Digital Central Office (DCO) in the United States territory of Guam.

The 7,000-line DCO will be the largest of the eight exchanges in Guam.

The DCO will be installed in the capital city of Agana and will be equipped with local and tandem extended area service. This installation will signal the start of a modernization of the island's telephone exchange network, including conversion from Guam's present electromechanical switching to Stromberg-Carlson's digital switching system.

Working Women. *A photo exhibit featuring "Women at Convair" was displayed in the Kearny Mesa lobby last month in conjunction with San Diego Women's Work Week. More than 1,700 women emloyees make up about 18 percent of the work force. The week dedicated to working women was said to be the first major celebration of its kind in the United States.*

Cmdr. Bush to Command Pomona's Navy Plant Office

A joint retirement and change of command ceremony recently took place at Pomona as Capt. Paul E. Smith, Commanding Officer, Naval Plant Representative Office, retired from the Navy and relinquished his command to Cmdr. Gary A. Bush.

"The U.S. Navy and General Dynamics have had an excellent working relationship under Capt. Smith's command, and I see no change in the relationship under my command," said Cmdr. Bush.

The ceremony took place before several hundred guests on the Pomona Recreation Association ballfield.

The featured speaker was Rear Admiral Wayne E. Meyer, Project Manager, Aegis Shipbuilding Project, and music was provided by the Air Ground Combat Center Drum and Bugle Corps, Twentynine Palms, Calif.

Capt. Smith joined the Navy in 1943 and entered the U.S. Naval Academy on a fleet appointment two years later. He completed four sea commands prior to his assignment at Pomona in 1977.

During his naval career, Capt. Smith served as Technical Officer to the Bureau of Weapons Representative Office at Lockheed Missiles and Space Co., Sunnyvale, Calif.; Director, Command Plans Division, Naval Ordnance Systems Command, Washington, D.C., Deputy Commander, Product Control Directorate; and Commander U.S. Naval Ammunition Depot, McAlester, Okla.

Cmdr. Bush attended the University of Arkansas prior to enlisting in the Navy in 1960. He attended Purdue University through the Navy Enlisted Scientific Education Program and graduated in 1965 with Bachelor and Master of Science degrees in electrical engineering.

Since June 1976, he has served as Project Managers Representative, Aegis Shipbuilding Project, with additional duties as Engineering Officer, Naval Plant Representative, Pomona Division.

Photo by William Mitchell

Change of Command. *Rear Admiral Wayne E. Meyer (at podium) was the guest speaker at a joint retirement and change of command ceremony as Capt. Paul E. Smith, Commanding Officer, Naval Plant Representative Office, Pomona, retired from the Navy after 36 years of service and turned over his command to Cmdr. Gary A. Bush. Left to right: Rear Admiral Meyer, Capt. Smith, Mrs. Smith and Cmdr. Bush.*

Magazine Features Employees In "Women in Aerospace" Story

Two General Dynamics employees were featured in the fall issue of *Aerospace,* the official publication of the Aerospace Industries Association.

Terry Sheehan and Natalie J. Krahl were included in "Women in Aerospace," an article which focused on the different careers American women are choosing today in the aerospace field. Sheehan is an aerodynamics engineer at Fort Worth and is part of the Advanced Wing Design department. Krahl is assistant project engineer in the Range Systems Project Office at Pomona.

Sheehan is an honor graduate of the Georgia Institute of Technology and previously worked in the Aero-Analysis group in Research and Engineering at Fort Worth.

Krahl also has had notable honors. Several years ago, her management ability won a company-paid enrollment in a two-year course at the University of California at Los Angeles called the Engineering Executive Program. She graduated from the University of California at Riverside.

Service Awards

Commercial

30 Years

At Material Service: James A. Kaye.

25 Years

At Stromberg-Carlson: Fannie L. Knight, Gail A. Stevenson.

At Material Service: Omer Glenn Walters, Paul C. Cuvala.

At Freeman United: Morris K. Cook.

20 Years

At Material Service: Daniel J. Walters.

At Stromberg-Carlson: Ben O. Lam, Ellis E. Samuels, Anna B. Shifflett, John P. Everett, Joann A. Usselman.

Convair

40 Years

D. M. Robinson, N. W. Merrill, C. R. Greenwood, H. G. Rexroad, P. L. Brady.

35 Years

F. J. Gianola, P. L. Akins.

30 Years

I. S. Hannibal.

25 Years

J. R. Bachman, M. R. Brock, V. L. Lintvedt, G. L. Getline, B. F. North, D. Johnson, H. H. Moran, W. K. Johnson, L. Lacava, M. Sturman, O. E. Morgan, R. Hornibrook, J. J. Olivarria, J. M. Varner.

Fort Worth

35 Years

R. D. Reece, C. W. Miller, A. C. Porter, J. W. Speight, M. L. Lewis, R. R. Simpson, W. E. Franz, A. S. Hutcheson Jr., L. L. Ledbetter, N. W. McLaughlin, L. J. Smith, W. D. Wills.

30 Years

E. W. Willett, W. J. Gage, S. L. Burris, H. L. Brown, A. J. Horan, J. R. Wilson, H. T. Neher, J. P. Williams, B. B. Witte Jr., W. R. Prasifka, J. W. Graham, A. G. Turett Jr., T. L. Walker, R. W. Wheeler, T. C. McAdams, R. W. Argabright, D. Wilkinson, D. G. Schomburg, H. A. Dossin, C. S. Heise, C. P. Hicks Jr., J. F. Garrison, R. L. Poteet.

25 Years

J. E. Crumpton, L. O. Kanouse, F. L. Bouton, A. L. Blackstock, B. R. Lane, T. L. Guthrie, D. L. Locke, J. V. Barnett, H. W. English, V. L. Richardson, L. Braziel, B. H. Loveless, R. C. Lee, C. E. Miller.

GD World

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EB's Veliotis Receives Award

P. Takis Veliotis, EB General Manager and GD Corporate Vice President, has received the National Management Association's Golden Knight of Management Award. The award, the association's highest honor, was presented to Veliotis for "outstanding leadership and technological innovations in the United States shipbuilding industry."

Veliotis received the award from Byron Solomonides, President-elect of the 58,000-member national organization, at a packed meeting of the EB Management Association on October 26 at the Norwich Sheraton Motor Inn.

In receiving the award, Veliotis said he considered it to "be shared equally with all of those who have made our progress over the past two years possible."

In a statement, Connecticut Governor Ella T. Grasso said of the award, "It is clear that Electric Boat, with Takis at the helm, has won renewed confidence from the United States Department of Defense . . . his goal was, and remains, to assure an operation of the highest quality that is economically viable."

A week earlier, in Washington, Secretary of the Navy Edward Hidalgo at his swearing-in ceremony, referred to Veliotis as a "crucial member of our shipbuilding industry."

As Assistant Secretary of the Navy, Hidalgo played a leading role in settling the shipbuilding claims between EB and the Navy last year.

During the Washington ceremony, the Secretary, in referring to Veliotis, said, "We disagreed consistently and persistently. But I know he was always a gentleman; I hope he could say the same about me. He stands very tall in my book."

Hickman Appointed Freeman VP Sales

Larry S. Hickman Jr. has been named Vice President, Sales for Freeman United Coal Mining Co., according to Lucian A. Lincoln, President.

In this position, Hickman will be responsible for developing new business in both the utility and industrial markets and will report to Richard J. Brooks, Senior Vice President, Sales and Marketing.

Hickman was formerly Assistant Vice President, Coal/Industrial Development, for the Illinois Central Gulf Railroad. Prior to that, he served in various management capacities in industrial development with Gulf, Mobile & Ohio until the time of its merger with the Illinois Central Railroad in 1972.

He is a graduate of Tri-State College, Angola, Ind., with a Bachelor of Science degree in civil engineering and also attended Purdue University, Lafayette, Ind.

ALCM Team Readies Missiles for Flyoff

When Convair-built AGM-109 missiles are launched from B-52s over the Utah desert or the Pacific Ocean in the U.S. Air Force's air-launched cruise missile (ALCM) competition, it is the moment of truth for dozens of individual Convair employees who prepare each missile for its test flight.

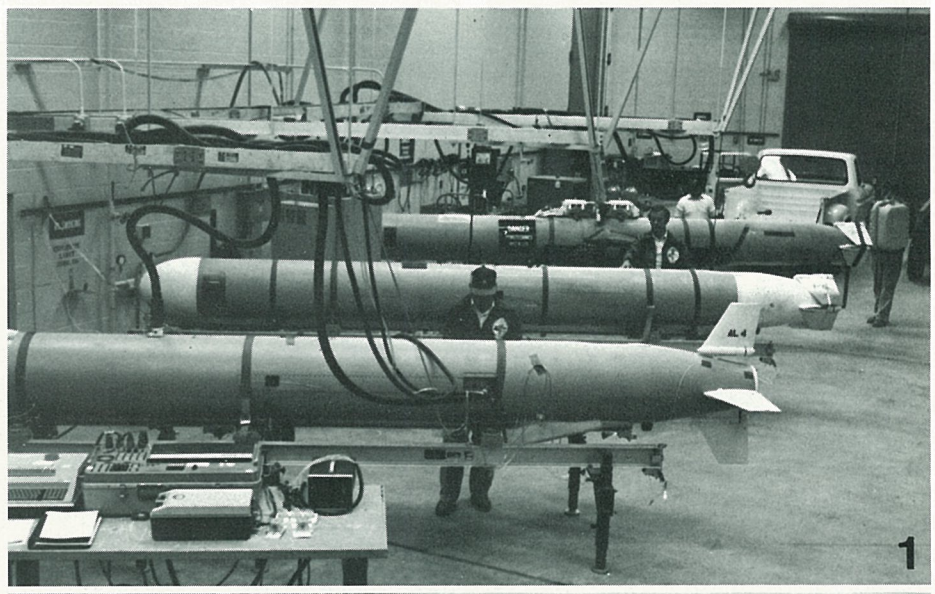
"When the missiles are installed on a wing pylon or on the rotary launcher in the belly of a B-52, the entire Convair ALCM team feels a sense of satisfaction," says Clay Dennis, Convair Test Base Manager at Edwards AFB, Calif.

The test group at Edwards was set up in March of this year and Dennis says the team of about 75 is made up of test engineers, planners, shop foremen, mechanics, missile technicians and quality control experts.

Also playing key roles are engineers from McDonnell Douglas and Williams Research Corp., makers, respectively, of the TERCOM guidance system in the AGM-109 and its turbofan cruise engine.

Actual missile assembly takes place at Convair's plant in San Diego, and when the missile arrives at Edwards, the test base becomes a beehive of activity. Quality and performance checks are made, and if the data are satisfactory, the missile is ready for its test flight.

The AGM-109s are not the only ALCMs carried on B-52s during test flights. On most missions, other pylon or rotary launcher positions are filled with test vehicles that are instrumented to give Convair and Air Force engineers data on the effects of a launch on other missiles.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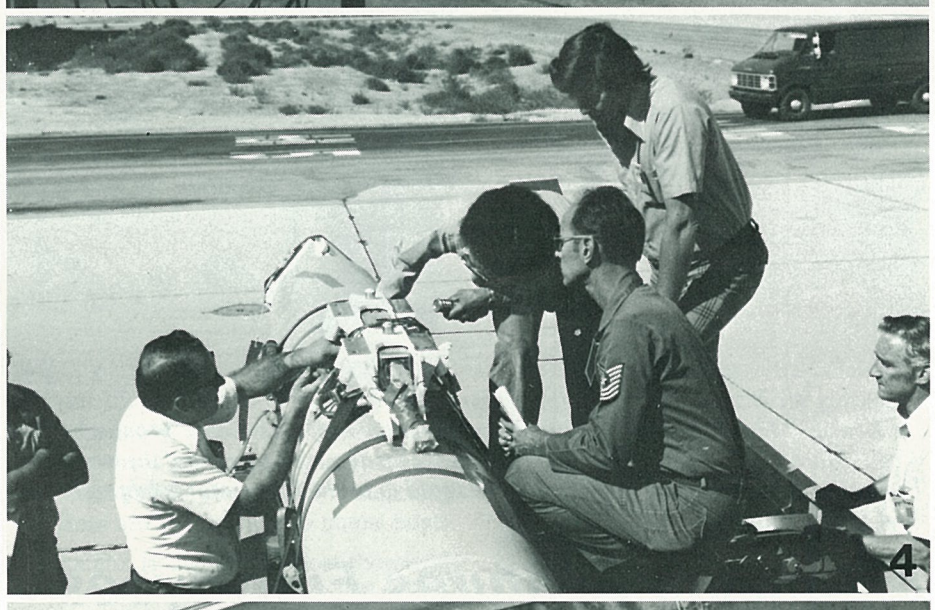
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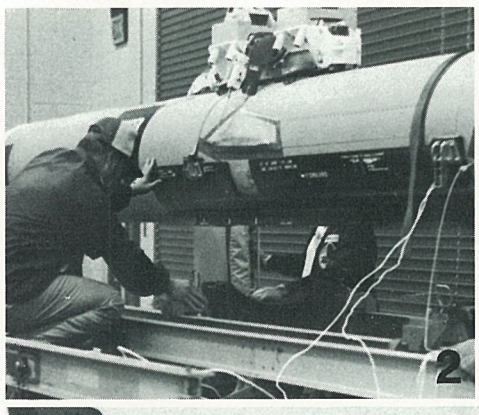
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Flight Preparations. *Crucial preflight tests are carefully performed on each AGM-109 air-launched cruise missile prior to test flights at Edwards AFB, Calif. Three Convair-built missiles are readied (Photo 1) in the Integrated Maintenance Facility at Edwards. AL-2, which flew on October 27, is loaded on a transporter (2), ferried across the base (3), inspected when it reaches the B-52 (4) and loaded into the bomber's rotary launcher (5 and 6).*

Attack Submarine Phoenix To Be Launched Dec. 8th

Electric Boat will pass another milestone next month with the launch of the *Phoenix* (SSN702), the 10th 688-class fast-attack submarine to hit the water at the Groton shipyard.

Elizabeth Harvey Rhodes, wife of U.S. Representative John J. Rhodes, Republican of Arizona, will christen the ship, and Congressman Rhodes, the House Minority Leader, will be the principal speaker at the December 8 launching ceremonies. Mrs. Rhodes welded her initials into the keel of the *Phoenix* during ceremonies at the shipyard on July 30, 1977.

The *Phoenix* will be the fourth submarine to be launched at Electric Boat this year. Two sister ships of the *Phoenix,* the *Dallas* (SSN700) and the *La Jolla* (SSN701), and the first Trident missile-firing submarine, the *Ohio* (SSBN726), entered the water earlier.

The *Phoenix* will join five other 688-class submarines undergoing completion at the shipyard after launch. Four other ships of the class built by Electric Boat have already been delivered to the U.S. Navy and 10 others are under contract for delivery over the next several years. In addition to the *Ohio,* six other Trident submarines are in various stages of construction at the yard.

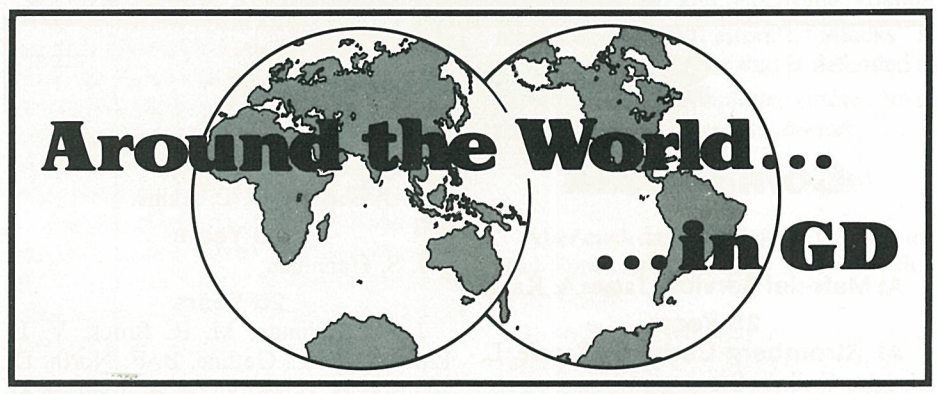
LNG Aries Aids 130 Boat People

Editor's Note: *The September issue of Energy Transportation Corp.'s newsletter carried the following entry from the log of* LNG Aries *which was built at Quincy Shipbuilding Division and delivered in 1977.* LNG Aries *has been transporting liquefied natural gas between Indonesia and Japan since that time. Energy Transportation operates the ships.*

5 May, 1979, 0525Local
Lat. 5°__ 32'N
Long. 107°__ 15'E (South China Sea)

Responding to visual distress signals from a tug and barge, 0555 stopped engines, maneuvering alongside an apparent Vietnamese refugee vessel. After consultation with the representative of the two crafts . . . and being assured that the crafts and about 130 people aboard were not in immediate danger of peril, I proceeded to render assistance with food, water, lube oil, diesel oil, charts, navigational instruments, a compass, a portable bilge pump, medical supplies and cigarettes. At 0955 after completion of transfer of all necessary supplies to reach their destination (Singapore) safely, the crafts were cast off and this vessel proceeded on her way toward Tobata, Japan.

H. W. Schonn, Master



AT CHQ: *Michael G. Barton* was promoted to Senior Auditor . . . *James E. Morgan* transferred from Pomona as Corporate Manager-Surface Weapons Systems.

At Convair: *Bill Shiba* was promoted to Engineering Chief . . . *Howard D. Tice* and *Rajendra K. Garg* joined as Design Specialists . . . *Richard S. Thomas* joined as Engineering Staff Specialist . . . *William R. Harger* was promoted to Manager-Test BGM-109 . . . *Cheng Donn* joined as Advanced Systems Project Engineer.

At Stromberg-Carlson: *Bill Pedace* transferred from EB as Telco Sales Administrator . . . *Charles E. Stoll* transferred from Pomona as Contracts Administration Director-Digital Systems Center . . . *Dan S. Zimmer* transferred from St. Louis as Director-Industrial Relations.

At Fort Worth: *Mark E. Frazier* joined as Chief-Quality Assurance . . . *Harold G. Thornton* and *Jerry L. Little* were promoted to Group Engineer . . . *Donald E. McDaneld* was promoted to Engineering Program Manager.

At Groton: *F. E. Miller* was named Superintendent of 2d Shift Operations.

At Pomona: *Grant E. Gabel* was promoted to Section Head . . . *Roger L. Johnson* was promoted to Group Engineer . . . *Charles E. Brockett* was promoted to Engineering Specialist.

At Material Service: *Arturo G. Nisperos* was cited as Chicago's Most Outstanding New Citizen of 1978-1979.

At GDCC: *Kevin P. Moersch* was promoted to Product Marketing Manager . . . *David F. Witter* was promoted to Manager of Contract Administration . . . *William T. Reynolds* was promoted to Director-Marketing Communications.

At DSS: *D. G. Chamberlain* transferred from Fort Worth as Software Engineer Specialist-DCSC . . . *Walter W. Magnus* transferred from Fort Worth as Computer Systems Analyst-CDSC.

At Electronics: *B. A. Christensen* was promoted to Director-Systems Engineering . . . *Franklin B. Osgood* was promoted to Director-GPS Phase II.

GD World

Vol. 9 No. 12 December 1979

EB Launches 688-Class Sub Called Phoenix

The high-speed attack submarine *Phoenix* (SSN702) was christened during ceremonies at Electric Boat Division at Groton, Conn., on December 8.

Elizabeth Harvey Rhodes, wife of Representative John J. Rhodes, Republican of Arizona, was sponsor of the ship, and her husband, the House Minority Leader, was the principal speaker.

Moments after Mrs. Rhodes christened the *Phoenix,* it slid into the Thames River before a crowd of thousands of officials, guests and shipyard workers and their families.

In his remarks, Congressman Rhodes said, "Since 75 percent of the world's surface is covered by oceans, our Navy has become America's first line of defense. This applies not only to tactical military strategies, but to our presence needed to keep the sea lanes open.

"We are dependent to an alarming degree on a very long, very thin line of oil tankers that bring us eight million barrels of oil a day. We also are dependent on ocean commerce for a wide range of raw products . . . .

"The launching of this attack submarine -- at a time when our oil supplies appear in possible jeopardy emphasizes our need for a nuclear Navy."

"I would like to take this opportunity to compliment the Navy, General Dynamics, the skilled workers who have built this ship and the top-notch crews who run the nuclear sector of our sea forces," the congressman continued.

"At a time when civilian nuclear power is under attack and has shown some questionable ability to operate with ultimate safety, the Navy has compiled a consistent record of safe and steady operation of nuclear-powered vessels."

This was the fourth submarine launched at the Groton shipyard in 1979. Earlier this year, Electric Boat launched the *Dallas* (SSN700) and the *La Jolla* (SSN701), both sister ships of *Phoenix,* and *Ohio* (SSBN726), the first Trident submarine.

The 360-foot, 6,900-ton *Phoenix* is one of the U.S. Navy's new 688-class attack submarines, the most advanced vessels of their type in the world. Their mission is to hunt down and destroy enemy ships. Well equipped for the mission, they are faster than their predecessors and carry highly accurate sensors, weapons control systems and computer complexes. Each ship is manned by a crew of 127.

Electric Boat has contracts for 16 of the fast-attack submarines and seven Trident ballistic missile submarines.

F-16 Continues In Australian Fighter Contest

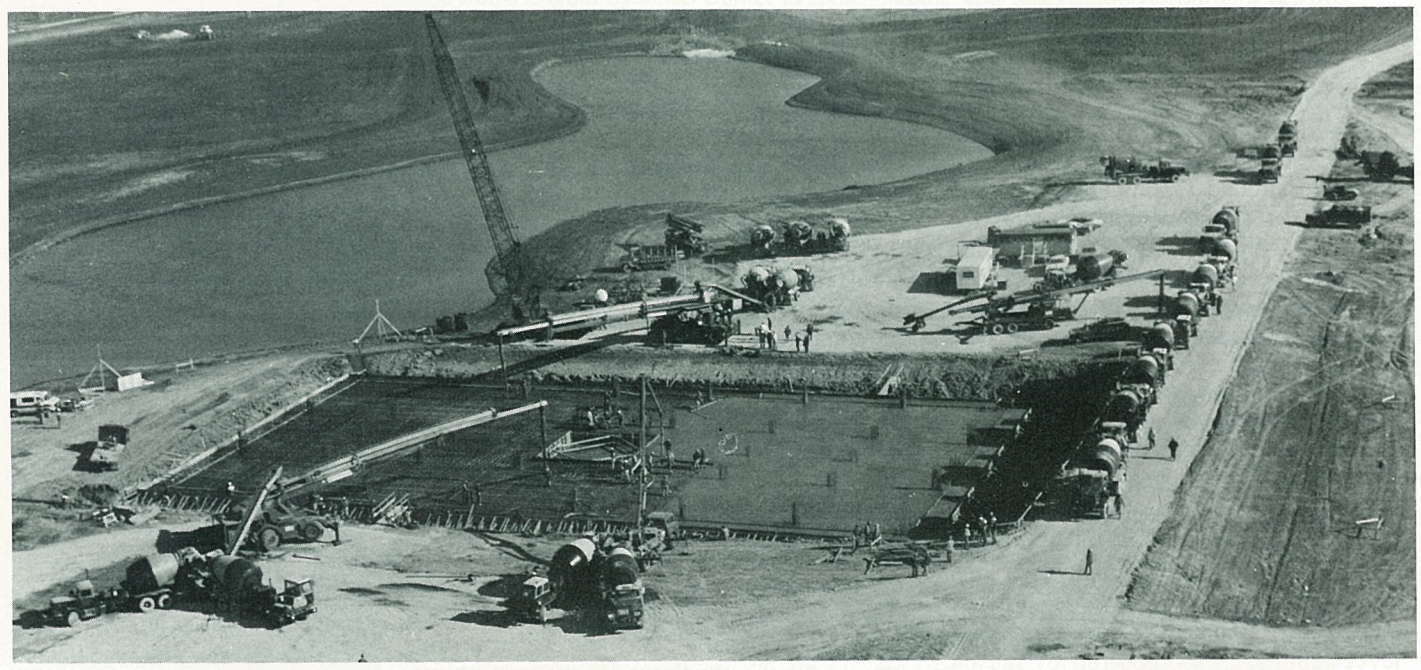
The government of Australia has announced that it has narrowed the candidates in its selection of an aircraft for its Tactical Fighter force down to the General Dynamics F-16 and the McDonnell Douglas F/A-18.

The Minister of Defense D. J. Killen said that the decision on the procurement of 75 new Tactical Fighter Force aircraft should be made "before the latter part of 1980."

Previously the competition also included the Northrop F-18L and the Dassault Bréguet Mirage 2000.

To date, plans for the procurement of more than 1,800 F-16s have been announced by six nations -- the United States, Belgium, Denmark, Norway, the Netherlands and Israel. F-16s already are being flown by the U.S. Air Force and the air forces of Belgium and the Netherlands. The Danish, Norwegian and Israeli air forces are scheduled to receive their first F-16s in January 1980.

The F-16 is a finalist in new fighter competitions currently under way in Canada and Spain.



Foundation Pour. *Material Service Corp. supplied nearly 500 truckloads of concrete to form a foundation mat for an office building in suburban Chicago in November. The pour was accomplished in less than 11 hours.*

Stromberg-Carlson Has a Present For Santa Claus

Santa Claus is getting a Stromberg-Carlson Digital Central Office. Honest.

The Perry Spencer Rural Telephone Co. has ordered a 1,600-line DCO for its offices in the city of Santa Claus, Ind.

Among the telecommunications presents in store for Santa Claus are Stromberg-Carlson's custom calling features: call waiting, call forwarding, three-way calling and speed dialing.

The Santa Claus system will also be equipped with two remote Digital Satellite Units (DSU) to serve the outlying areas of Kitterman and St. Meinrad, Ind. The DSU makes efficient, cost-effective, full-featured telephone service available to smaller, scattered or isolated communities. Each DSU can serve up to 240 subscriber lines.

Quincy Receives Barge Contract

Quincy Shipbuilding Division has been awarded a $23 million contract for the construction of two oil barges.

The barges will be built for Bulkfleet Marine Corp. of Houston, Tex., and are scheduled to be delivered late next year. They will be used by Bulkfleet to transport petroleum products.

Material Service Concrete Pour Awes Construction Veterans

By G. Alexander Smith

Grown men are often turned into fascinated small boys when they pass a construction area, but even veteran construction workers were impressed on November 17 when Material Service Corp. delivered nearly 4,000 cubic yards of concrete to a Chicago area building site in a single day.

Material Service marshalled a fleet of 75 of its ready-mix trucks for the job which required nearly 500 deliveries in less than 11 hours.

One worker, watching five Material Service trucks pour concrete while a dozen others waited their turn and still others arrived and departed, said, "I've seen a lot of foundations poured, but in 15 years I've never seen anything like this."

The 244 x 122-foot foundation, averaging four feet in thickness, was for a 14-story office building being built in Itasca, Ill., a few miles west of Chicago's O'Hare International Airport. The foundation was designed to 'float' in the ground as a single slab, strengthened by 640 tons of reinforcing rods. Usually, foundations rest on piles which are sunk down to bedrock.

The challenge took Material Service two weeks to plan and required complex coordination and minute-by-minute timing. Three Material Service ready-mix yards prepared the concrete, 75 trucks delivered it, and additional trucks replenished the supplies of aggregate at the yards from two Material Service gravel pits 20 miles away.

More than a hundred employees were involved in batching the concrete, transporting the gravel and concrete and coordinating the operation. The result was a constant stream of red and yellow Material Service trucks arriving at the site at one-to-two-minute intervals from dawn to dusk.

Proudly watching the trucks, Frank R. Burke, General Sales Manager, said, "We've had a pour that was bigger than this one, but we've never delivered as much concrete to a single site in such a short period of time. This is really something . . ."

While Material Service was planning the operation, the site was being prepared by the contractor to receive it. A shallow excavation was dug, the reinforcing rods were placed, and the foundation shape was outlined by plywood forms.

On the morning of the pour, three huge concrete conveyers were positioned on the sides of the foundation. The conveyers used moveable booms and belts to pick up the concrete from ground level, lift it over the foundation and then drop it down a chute to where it was needed. Each of the conveyers could deliver 200 cubic yards of concrete per hour.

In addition, a concrete pump was ready that could handle an additional 80 yards of concrete an hour.

Continued on Page 2

Trophy Winner. *A U.S. Air Force unit from Pease AFB, N.Y., flying FB-111A strategic bombers (above) won the Fairchild Trophy, the top overall award in the Strategic Air Command's Giant Voice '79 precision bombing competition. A unit from the Tactical Air Command flying F-111D fighter-bombers won the Mathis Trophy (See Story Page 2).*

FB-111As, F-111Ds Win SAC Bombing Contest

U.S. Air Force units flying General Dynamics FB-111A strategic bombers and F-111D fighter-bombers took first places in the Strategic Air Command's Giant Voice '79, the annual precision bombing and navigation contest.

The FB-111s and tankers from the 509th Bombardment Wing at Pease AFB, N.H., won the Fairchild Trophy, the top overall award, for the best combined scores for bombing, short-range attack missile firing and precision navigation. It was the fifth consecutive year that an FB-111 unit won the overall competition.

See Photo Page 1

In the previous four competitions, the FB-111s and tankers from the 380th Bombardment Wing at Plattsburgh AFB, N.Y., won the Fairchild Trophy. The 380th was second to the Pease wing this year.

The Mathis Trophy, awarded for the most points compiled in high- and low-level bombing, was captured by the F-111Ds of the 27th Tactical Fighter Wing at Cannon AFB, N.M. The 27th also won the Meyer Trophy, which is awarded to the F/FB-111 unit judged best in low-level bombing and electronic countermeasures effectiveness.

This was the second year that F-111 fighter-bombers participated in the annual bombing competition.

An FB-111 crew from the 380th Bombardment Wing won the Bombing Trophy for amassing the most points in high- and low-level bombing.

Personnel from the Strategic Air Command, the Tactical Air Command, the North American Air Defense Command, the Air Force Reserve, the Air National Guard and the Royal Air Force Strike Command participated in Giant Voice '79. The competition began last August and was completed on November 29.

Material Service Pours Huge Mat

Continued from Page 1

The equipment and perhaps a hundred concrete finishers, carpenters, iron workers, operating engineers and laborers were ready at dawn when the first Material Service truck arrived on schedule.

Another six trucks arrived in rapid succession. Within minutes, a constant stream of wet, grey concrete was spilling through the chutes into the foundation. As the concrete began to fill the space around the reinforcing rods and cover the top rods, the concrete finishers started to smooth the full surface.

Hour after hour, the red and yellow trucks arrived, poured and returned to their yards for another load. In the first eight hours, Material Service delivered an average of 455 cubic yards of concrete an hour.

The trucks were coordinated by a dispatch board located 20 miles away at Material Service's headquarters in downtown Chicago. Each truck was equipped with a radio transmitter that kept the dispatchers abreast of the trucks' activity -- loading, traveling to the site, pouring, or returning to the yard. The drivers were notified of schedule changes by voice radio.

The communication was critical, for concrete begins to set within a short time after it is mixed, and a delay anywhere in the operation could mean that the concrete might begin to set in the trucks before it was poured, or that the pour might be held up because of a temporary lack of concrete.

"Keeping the pour constantly going was a real challenge," said Dan Schwind, General Manager of Ready-Mix Operations for Material Service." With a job that large, there could have been a hangup anywhere along the line.

"But there were no problems, no hangups," he said. "Our people wouldn't let anything go wrong. The Itasca pour was one of our biggest challenges, and it was one of our best days."

Savings And Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of October were as follows:

Salaried	
Government Bonds	$ 2.2271
Diversified Portfolio	1.4977
Fixed Income	1.0315
Hourly	
Government Bonds	2.2272
Diversified Portfolio	1.5324
General Dynamics Stock	$45.38

LNG Virgo Is Named At Quincy

The eighth liquefied natural gas (LNG) tanker built by Quincy Shipbuilding Division, was named the *LNG Virgo* during ceremonies at the shipyard on November 28.

The 936-foot-long *Virgo* is scheduled to join seven sister ships that are already delivering LNG to Japan from Indonesia.

Speaking at the ceremony, Stanley J. Wilson, the Group Managing Director for Burmah Oil Co. Ltd. of England, said tapping reserves of natural gas already available in many countries "is one of the simplest ways of developing new sources of energy."

Wilson's wife, Molly, christened the ship before a crowd of officials, guests and shipyard workers and their families.

The Burmah Oil official said he found it "incredible that we should stand around bewildered at the disappearance of old sources of energy, while doing almost nothing to open up new resources that are already available."

See Related Story Page 4

In his remarks, Wilson said the world could open up new resources "by recreating the necessary will, determination and urgency."

"Will the lights have to go out?" he asked. "Will we have to freeze in winter before we come to understand the speed of change, the far-reaching nature of change and the urgent need to adapt ourselves to change?"

Wilson said that the LNG tankers built at Quincy can provide the transport for new sources of energy.

"Ships built in this yard are no longer prototypes," he said. "They are the norm." By the end of this year, the Quincy-built tankers will have made 177 round trips to Japan and will have delivered 469 billion cubic feet of natural gas -- enough to heat the homes in the greater Boston area for 12 years.

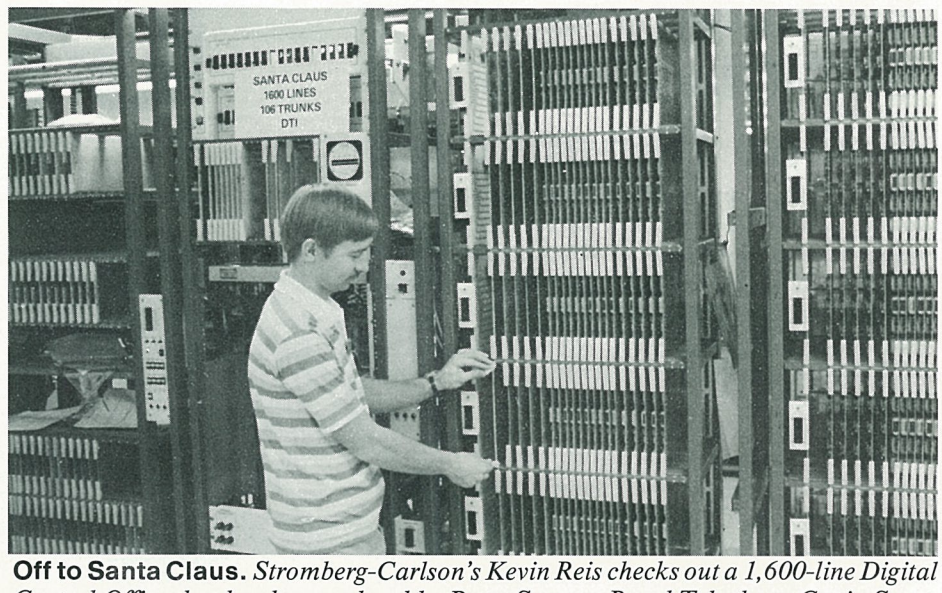
"Performance Is . . ." Wins Film Award

The General Dynamics-produced film "Performance Is . . ." was awarded the Gold Medal for Best Film in the Documentary In-House Production Category at the Houston International Film Festival on November 17. The film competed against more than 100 others in its category.

"Performance Is . . ." was produced by Convair's Motion Picture Department for use at the 1979 shareholders' meeting and documents 12 months of achievements by General Dynamics. Since the meeting, the film has been shown throughout the company.

Convair's C. N. DeMund directed the film, and John Grey 3d was the film's editor.

Original footage for "Performance Is . . ." was supplied by all divisions and subsidiaries of General Dynamics.



Off to Santa Claus. *Stromberg-Carlson's Kevin Reis checks out a 1,600-line Digital Central Office that has been ordered by Perry Spencer Rural Telephone Co. in Santa Claus, Ind., the traditional mailing site for millions of Christmas greeting cards each year (See Story Page 1).*

S-C Cuts Over Largest DCO in the United States

Stromberg-Carlson cut over the largest Class 5 Digital Central Office (DCO) in the United States -- a 7,000-line system for the Fort Bend Telephone Co. on November 30.

Located at Fort Bend's Waddell Exchange in Katy, Tex., this system surpasses Stromberg-Carlson's previous record of a 5,000-line system in Hudson, Ohio, for Western Reserve Telephone Co.

The Waddell DCO provides local service to Katy as well as extended area service to nearby Brookshire, Tex., and extended metropolitan service to Houston, which is 30 miles from the system site.

Two hundred lines will be dedicated to each Stromberg-Carlson custom-calling feature: call waiting, call forwarding, three-way calling and speed dialing. The call waiting feature sounds an alert tone informing a subscriber that another call is waiting. By touching the hook switch, the subscriber can alternate between two conversations. With call forwarding, the subscriber can forward all calls to a specific number by dialing a special code. Using three-way calling, a conversation can be turned into a conference call by simply touching the hook switch. Speed dialing allows frequently called numbers to be accessed by dialing only one or two digits.

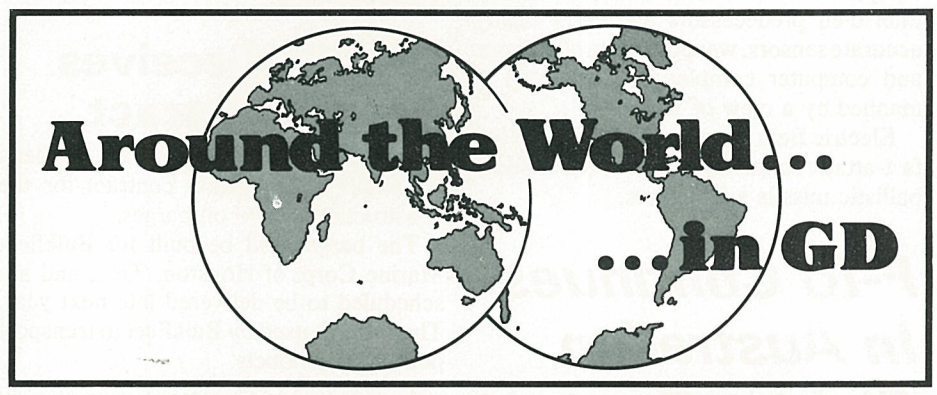
The $1.6 million Waddell system will also be equipped with both Distributed Network Interface (DNI) and Digital Trunk Interface (DTI). DTI converts analog trunk transmission signals into digital signals, while DNI acts as a line concentrator and allows a telephone company to serve more subscribers within its system.

Social Security Taxable Wage Base Raised by $3,000

The Social Security taxable wage base for 1980 has been increased to the first $25,900 of annual income. The new rate reflects a $3,000 increase over 1979's base of $22,900.

Although the Social Security Tax rate remains at 6.13 percent, employees will pay a maximum of $1,587.67 because of the wage base hike. General Dynamics matches employees' contributions to the Federal Insurance Contributions Act (Social Security) dollar for dollar.

Since W-2 Forms will be mailed in January, employees are reminded to check to be sure that the company has a correct mailing address. If in doubt or if you have recently moved, complete a change of address form and submit to your payroll department.



At CHQ: *Maynard L. Monroe* and *Clyde J. Perry Jr.* were promoted to Corporate Manager-Pricing . . . *Clifford R. Shannon* joined as Supervising Sr. Auditor . . . *Joseph P. Sutherland* joined the Washington Office as Corporate News & Information Specialist Sr . . . *Craig M. Chamberlin* joined as Associate Auditor . . . *Roy T. Davis* joined as Manager of Corporate Accounting . . . *Paul T. Scanlan* joined as Corporate Director-International Operations.

At Pomona: *Wilmer Olson* was promoted to Manager, Quality Assurance . . . *Charles E. Blood* was promoted to Program Director of Standard Missile 1 & 2 . . . *Harry Schwartz* joined as Manager, Contract Administration . . . *Barry E. Franco* was promoted to Assistant Program Director-VIPER.

At Convair: *Ruel V. Weas* was promoted to Engineering Manager . . . *Lawrence E. Langley* joined as Engineering Director . . . *George M. Esslinger* was promoted to Director Manufacturing Engineering . . . *Hugh Reynolds* was promoted to Group Engineer.

At Electric Boat: *Gerard P. Burkhardt* transferred from Quincy and was promoted to Principal Engineer . . . *Robert L. Wylie* was promoted to Manager of Financial Analysis . . . *Elio Mendillo* was promoted to Manager of Operations-Avenel.

At DSS: *B. A. Kelly* transferred from Fort Worth as Software Engineering Specialist . . . *Carol L. Keith* was promoted to Engineering Software Supervisor Computing Information & Assistance at WDSC . . . *Robert J. Eaton* was promoted to Software Design Specialist Range Systems at WDSC . . . *George A. Calvin* was promoted to Software Design Specialist Automated Test Systems at WDSC . . . *David D. Flowers* transferred from EDSC as Sr. EDP Auditor.

At GDCC: *Anthony J. Barca* joined as Vice President-Eastern Area . . . *Michael A. Janas* joined as Vice President-Sales and Field Operations.

At Fort Worth: *Frederick L. Kelly Jr.* was promoted to Project Manager.

At GDSC: *D. N. Kahler* transferred from EB as Sr. Project Engineer.

Foam Packing. *Willie Cummings, Export Packer, sprays foam into a packing container at the Stromberg-Carlson Digital Systems Center Shipping and Packing Department.*

Chemical Expanding Foam Protects Delicate S-C Equipment

Liquid chemicals and heat combine for surprising results in the shipping and packing department at Stromberg-Carlson's Digital Systems Center in Tampa, Fla.

When activated by heat, the chemicals – polyol and isocyanite -- form a foamy substance that expands, envelops and protects the company's delicate switching equipment components during shipment.

"Packing an entire central office system requires a certain set of procedures to insure its safe arrival," said Ray Jordan, General Supervisor, Shipping, Traffic and Receiving. "Separate, delicate components are more vulnerable. They need to 'float' to their destination."

When a component is shipped within the United States, packing personnel spray the chemical liquids into the bottom of a corrugated cardboard shipping box. In a few seconds, the substance begins to foam and expand. As it expands, the foam hardens slightly until it becomes a substance that looks and feels like bread dough. The component is covered in plastic and placed on top of the foam substance. More liquid is sprayed around the plastic-covered piece, the foam rises again and the box is shut and sealed. If necessary, the foam substance can be layered around several pieces of equipment in the same box.

"Our foam machine allows us to use the safest, most economically efficient way to pack and ship separate components," said Jordan. "Since we've started using this method, we've received many compliments from pleased customers."

Central office systems with all switching components housed and protected within cabinets require a different set of packing procedures. Before shipment on a trailer carrier, the system is sealed in a plastic bag containing desican, a flour-like compound which absorbs moisture. It is then encased in wood with metal reinforcing bands, wrapped in blankets and strapped into padded walls inside the carrier. Shock mounts on the bottom of each boxed system and air-ride shock-absorbent trailer carriers further soften any bumps en route.

Lake Mary DSC Expansion Planned

Stromberg-Carlson plans to expand its Digital Systems Center (DSC) at Lake Mary, Fla. The expansion will provide additional space for production and testing of System Century® digital switching equipment and will also include a new employee cafeteria.

Fifty-thousand square feet of space will be added to the nine-year-old center to accommodate the growing number of orders for System Century, according to W. J. Brown, Vice President of Digital Operations.

Stromberg-Carlson's four manufacturing facilities in central Florida currently have a total of 341,000 square feet of space. Construction of the DSC addition is scheduled to begin in January 1980, with occupancy planned for September 1980.

GD World

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Manager of Internal Communication
G. Alexander Smith
Associate Writer
L. Christine Cascella

Pomona Awards European Firms Missile Contracts

General Dynamics has awarded contracts totaling $4.5 million to four European industrial firms for full-scale development work on the RAM guided missile weapon system.

The four companies, all headquartered in West Germany, are AEG-Telefunken, Diehl, VFW-Fokker and Hoesch Rothe Erde.

Pomona Division is prime contractor for the RAM system, which will provide ships with a low-cost, high-firepower capability for defense against enemy antiship missiles. The RAM development program is a joint effort of the United States, West Germany and Denmark.

The full-scale engineering development work by the German firms involves design, development and manufacture of four prototype command and launch systems and is expected to be completed by mid-1981.

Stromberg Job Upgrade Program Helps Workers Reach Their Goals

Margaret Lemon had worked for two years as a stock clerk at Stromberg-Carlson's Digital Systems Center at Lake Mary, Fla. When she saw an opening for an expeditor listed on the facility's bulletin board, she submitted a request to upgrade her position and now she is an expeditor.

Lemon was selected for her new postition through Stromberg-Carlson's Job Upgrade Program. The program has proven to be a highly successful method by which employees can improve their job status and earning power within the company. Facilities in central Florida, Rochester, N.Y., Charlottesville, Va., and Ardmore, Okla., all use some form of the upgrade program for employees through their Industrial Relations departments.

According to David Robinson, Industrial Relations Representative who coordinates job upgrades for the company's Florida facilities, the program "is a good motivator. It creates a competitive atmosphere and builds incentive for employees."

When Robinson receives notice of a job opening, he posts the job with title, number, grade and description on bulletin boards throughout the facilities. The job remains posted for two days, and during that time all interested employees submit upgrade requests. Personnel who have been employed for at least six months and who have held their current job for six months or more are eligible to request upgrades.

Lemon, for instance, was considered according to her level of seniority, eligibility and qualification and was compared with nine other applicants. Lemon and the other candidates were then interviewed by the job's supervisor. The supervisor determined that Lemon was the senior, eligible employee and was best qualified for the expeditor position.

"Stromberg-Carlson's Job Upgrade Program is definitely in the best interest for everyone involved," said Robinson. "It utilizes the fairest means that we know of to give all employees a chance at reaching their full potential within the company."

DatagraphiX Tax Administrator Faces April 15th All Year Long

He doesn't work for the Internal Revenue Service, but he has a taxing job and claims to love it. From eight until five each day, Andy Anderson files tax forms, processes insurance claims, and handles the many job responsibilities of DatagraphiX' Tax Insurance Administrator.

Why would anyone choose to spend his time doing what so many people find frustrating?

"It is a real challenge to me to work with the state and Federal governments as well as a large number of insurance companies," Anderson explains. "I love communicating with a variety of people, and what many would find routine I find interesting and exciting."

Anderson's responsibilities include administering corporate taxes and insurance programs. He files all of DatagraphiX' municipal, state and federal tax returns -- over 500 different forms each year. Anderson also oversees insurance policies and files claims to cover lost or damaged shipments of DatagraphiX equipment. Both aspects of his job require a great deal of attention to detail -- plus a great deal of patience.

"In my job, April 15th comes a dozen times a year. Every month, quarter and year-end, I process returns for sales, property and income tax. And since laws and requirements change frequently, keeping up with all of the deadlines and the paperwork is a very taxing job," he says.

DatagraphiX must pay state sales tax in every state where the company sells its products. That means Anderson must file returns each month. Since DatagraphiX offers a leasing plan to customers in all 50 states, he must also file property tax returns to over 150 jurisdictions.

Income tax returns must be filed at both the state and federal level each year. The state tax is calculated by the company payroll, property value and sales dollars generated within each state during the year. The federal tax is based upon the company's profit for that year.

The large number of tax returns doesn't bother Anderson: "When I came to work for DatagraphiX 12 years ago, I had an accounting background but very little familiarity with the tax system," Anderson commented. "But I enjoyed learning the system and found that I had an affinity for the job. Since then I have learned a tremendous amount, and I am still learning."

Con-Trib Club Pledges Double At Pomona

Pomona's Con-Trib Club, an employee-volunteer nonprofit group, has pledged $194,014 to support local community and social agencies for 1980 -- an increase of nearly $95,000 over last year's campaign.

According to Greg Hill, Con-Trib Club Chairman, 22 organizations will receive varying sums of the $194,014 total. The 22 groups include the United Way, International Guiding Eyes, Retarded Children's Association of the San Gabriel Valley, Boy Scouts of America and the Con-Trib Club Employee's Emergency Fund.

Pomona's Con-Trib Club was formed in 1952 to pool employees' contributions to charitable organizations instead of donating them through in-home solicitations. A committee of 12 employees, six representing management and six representing union members, was established to decide how the contributions would best be distributed.

The determination of where the funds are allocated is based upon where GD-Pomona employees live and how much a receiving organization or agency contributes to the community. To qualify for funds, an organization must be nonprofit and have a board of directors.

Another function of the Con-Trib Club is to provide emergency assistance to Pomona employees in case of fire, theft or extended illness or disability. These funds are available to employees if they can show "a definite need and not just an overextension of their incomes," said Hill.

Lt. Gen. Skantze Visits Convair

Lt. Gen. Lawrence Skantze, Commander of the Air Force's Aeronautical Systems Division, visited San Diego on November 29 for a tour of the Convair plant and an evening address to the local chapters of the American Institute of Aeronautics and Astronautics (AIAA) and the Air Force Association.

During his visit to Convair, Gen. Skantze was briefed on the company's cruise missile programs, including the Air Force's air launched cruise missile (ALCM) and ground launched cruise missile (GLCM). The discussions were led by Convair General Manager Dr. Leonard F. Buchanan, William C. Dietz, ALCM Program Director, and Bernard J. Kuchta, Deputy ALCM Program Director.

The general also was given a tour of the Kearny Mesa and Lindbergh Field manufacturing facilities, including stops at the mockups of the GLCM transporter erector launcher and launch control center, the cruise missile assembly area, electronic beam welding and the Systems Integration Laboratory.

LNG Virgo Wins High Marks on Her Sea Trials

By Jim Reyburn

Seven stories above the surface of the Atlantic Ocean, the deck beneath me began to shudder. *LNG Virgo,* Quincy Shipbuilding Division's eighth liquefied natural gas tanker, was coming to a crash stop 40 miles off the coast of Massachusetts.

Virgo wasn't in trouble. The ocean-going giant, three football fields long, was on sea trials, her final exams before joining her seven sister ships carrying liquefied natural gas (LNG) from Indonesia to Japan. The crash stop was one of dozens of events, as they're called, she'd been performing all day.

Granted, it was a staged stop. But as I strained for a look at the digital readout speed and propeller turn indicators in the hushed, darkened wheelhouse, I couldn't help being caught up in the excitement of the moment.

A panic stop on a 936-foot, 95,000-ton tanker plowing through the water at 21 knots isn't exactly like jamming on the brakes in the family car. The maneuver takes eight minutes and four miles. There's no rubber to grab the road, only metal biting into water. In this case, it was *Virgo's* huge six-bladed propeller, 26 feet in diameter, turning in full reverse.

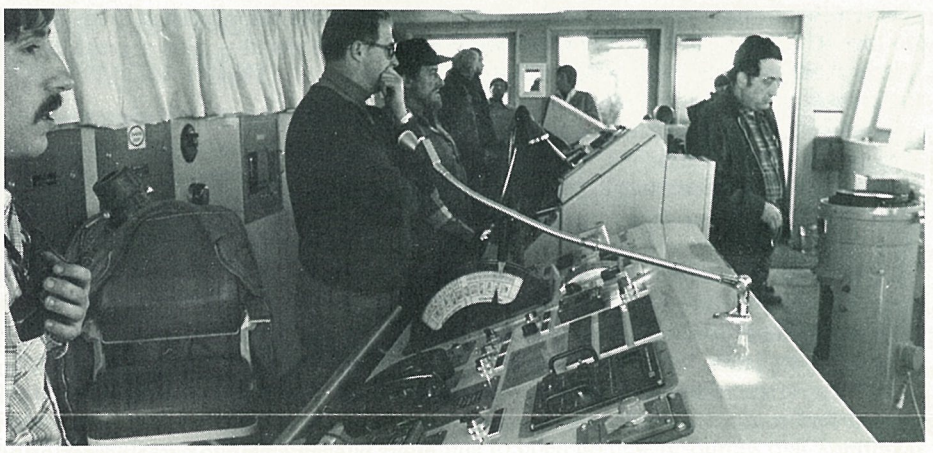
Not Like Stopping A Car

Over a hearty breakfast of orange juice, cereal, scrambled eggs, toast and tea (the first of four excellent meals on the trip), I learned that I was shipping out with 207 other people -- the 135-man trial crew, 16 engineers, 25 subcontractor representatives and 12 food service employees. In addition, there were assorted representatives of the operators, and inspectors from the Coast Guard, Maritime Administration and American Bureau of Shipping.

Automation will allow *Virgo* to operate with a surprisingly small crew of 30. To accommodate the much larger contingent aboard for the trials, steel double-decker bunks had been set up in staterooms, (each one normally has a single built-in berth), the normal berthing area and below decks.

It's hard to say who was busiest during the trials. The level of energy was impressive, especially among the trial crew. Members stood watches on a six-hours-on, six-hours-off basis. Strictly business all the way, they were obviously proud of their work -- fine-tuning a marvel of today's shipbuilding technology.

Following breakfast, I found my way to the bridge four levels above (reachable by elevator, then stairways.) It's easy to see why the bridge, or wheelhouse, is considered the brains of a ship. The console fairly bristled with sophisticated electronic gear -- radar screens, fathometer, engine order telegraph, speed and propeller turn indicators, even a collision avoidance system. In the middle, of course, was the wheel. Just behind the wheelhouse was the chart area, where courses are plotted and positions checked.



On Her Way. *Trial crew members (left to right) George Desroiers, Harold Swenson and John Poulos man the giant console in the wheelhouse of* Virgo.

When *Virgo* finally stopped, word went out that she had performed admirably. She received high marks from a Maritime Administration representative, who said that it had gone "very smoothly, very efficiently."

The crash stop was just one highlight in a 27-hour trip that showed me just what you do to check out a super tanker.

In addition to the crash stop, *Virgo* twisted through an ahead steering test (jamming the wheel full right and full left while running at speed) grueling endurance tests, both ahead (four hours) and astern (a half hour), and speed runs (21.5 knots top speed).

There were also countless tests and demonstrations of equipment -- the gyro and magnetic compasses, automatic direction finder, radar, radio, collision avoidance system, satellite navigation gear, anchor windlass, wind speed and direction indicating instruments and watertight doors and hatches.

To be part of all this action, I had arrived at Quincy Shipyard's Pier 13. *Virgo* was to leave at precisely 7 a.m. Riding up the three stories from the dock to the deck on an elevator, I was awed by *Virgo's* massive size. With her five LNG cargo spheres and superstructure jutting into the glowing dawn, she dominated everything around her.

On deck, I got my first taste of the efficient planning that goes into a sea trial. A guard gave me a cheery greeting, tagged my car keys to keep them ashore for the return and handed me a brochure on the sea trials. Attached to the brochure was a small yellow reference card with my name, berth assignment (second officer's stateroom) where to go for meals (officers' mess) and a list of emergency telephone numbers (telephones throughout the ship). The card should be with me at all times.

I trundled to the 03 (third level) deck in the superstructure, stowed my gear (two roommates) and headed for the officers' mess.

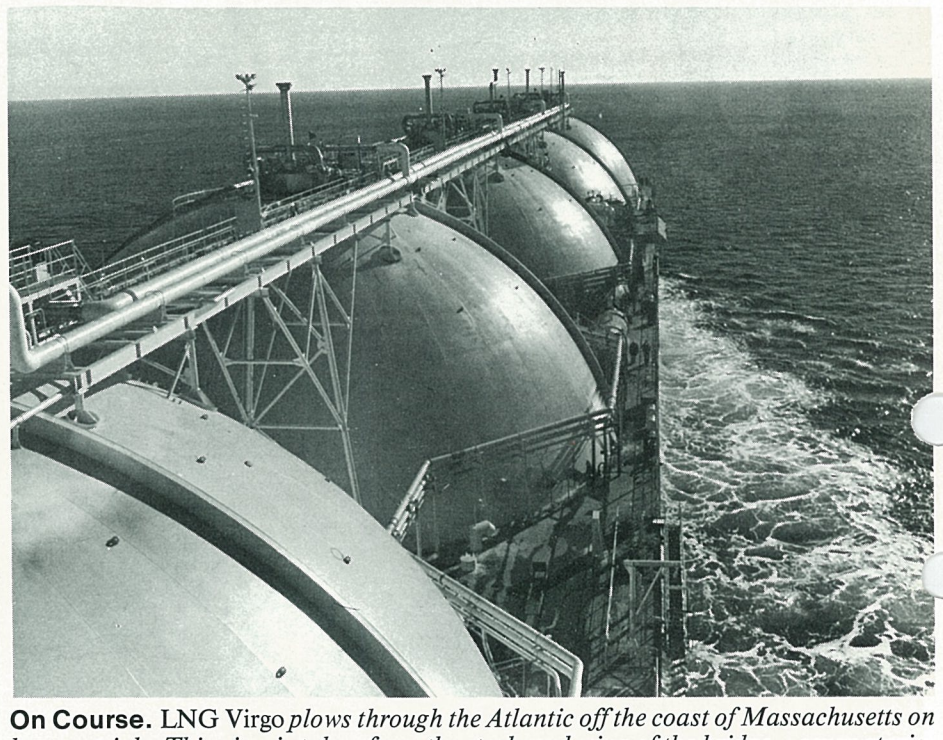
The bridge was bustling with activity prior to getting under way. The company-hired master ("You probably won't believe this, but my name is Capt. John Smith," he had told me earlier) was checking last-minute details with Quincy's Harold Breite, the Trial Coordinator. Tom Pardy, aboard to check compass adjustment once we were at sea, stood looking at the magnetic compass.

At 7 a.m., one of the six tugs that had been floating nearby began towing us stern first out of the basin. Once clear, the ship, with tugs dancing attendance, turned on her 2,200-horsepower electric bow thruster motor, the largest such motor ever fitted into a ship, for the swing to starboard to get into position to pass through the Fore River Bridge opening. The bow thruster, a large propeller housed sideways in the bow, helps *Virgo* maneuver in close quarters.

Threading the Needle

Quincy veterans call the bridge transiting maneuver "threading the needle." That's an apt description. The LNGs are 143 feet wide. The opening for the lift bridge is 175 feet wide. As we eased through the opening with a scant 16 feet to spare on each side, two tugs that had scampered through ahead of us nudged *Virgo's* forward end, keeping her lined up. Vehicles were stopped on both sides of the road leading to the bridge, and dozens of motorists had abandoned their cars to gape at the monster towering over them.

Just through the bridge, *Virgo* took a sharp turn to starboard and headed out into the tricky channel. For the better part of an hour, Capt. William Mitchell, a harbor pilot, was guiding the ship to the open sea.



On Course. LNG Virgo *plows through the Atlantic off the coast of Massachusetts on her sea trials. This view is taken from the starboard wing of the bridge -- seven stories above the water.*

The already busy day was just beginning. During the next several hours, *Virgo* made a four-hour endurance and speed run. I climbed down 80 feet into the cargo spaces with an inspection crew to check the integrity of the ballast tanks, yet another event, and toured the ship with Bill Clary, Quincy's chief naval architect and one of my two roommates.

Clary knew the ship inside out and obviously was proud of it. First stop was the cargo control room about two-thirds of the way forward on *Virgo.* It's from here that the ship is loaded and unloaded, trimmed and ballasted -- operations all handled by computer.

Jack Leydon, who has charge of the cyrogenic testing, explained that Virgo is a constant draft vessel, which means that she maintains a 36-foot depth when loaded or unloaded.

There are two reasons for the constant draft operation. First, it minimizes the flexibility needed in the cargo loading arms extended from shore terminals. Second, it keeps the propeller submerged when the ship is running empty (as we were) on the return trip. The constant draft is effected by pumping water into ballast tanks when the cargo goes out and vice versa when the cargo comes in.

From the cargo control room we moved to the machinery spaces (engine room) aft, the heart of *Virgo.* I dizzily gazed down 80 feet onto the two large turbines (generating a hefty 43,000 horsepower) that drive *Virgo.* Running at full power, the ship operates half on fuel oil, half on LNG boiloff.

As we stepped into the engine room control room, nearly a dozen people stood poring over a huge console. Trial crew-members had on snappy dark blue overalls with "General Dynamics" in large white letters on their backs, one example of the *esprit de corps* the crew showed throughout the voyage. Clary said that one man usually operates the console while the ship is under way.

By 10:30 p.m., most of the sea trial events had been completed. I turned in, my mind filled with statistics on LNG tankers. Those facts and figures were still milling round during breakfast at 6 a.m.

From tablemate Capt. Smith, I learned that Ron Emery, the harbor pilot, had decided against taking the ship back to the shipyard. The wind was gusting at 30 to 40 knots out of the northwest, spelling problems for any ship as large as *Virgo* trying to navigate the narrow Fore River Bridge opening.

Word got around fast that we were going into Boston Harbor to drop anchor. There, those people not part of the actual trial crew would be taken back to Quincy on a ferryboat that would meet us. *Virgo* would wait out the wind.

At 9, I joined those leaving on deck as the Massachusetts Bay cruise line boat, *Nantascot,* a tiny 65-footer, came alongside. Twenty-five minutes later, *Nantascot*

'With Flying Colors'

pulled away from *Virgo* and headed for the shipyard. At 10:20 we landed. Tired but happy, we said our gooddbyes.

Virgo's sea trial marks were made public two weeks later at the naming ceremony November 28. They were high. Quincy General Manager Joseph Lennox, who had also sailed on the trials, put it this way to the thousands gathered at the yard, "In every case, this magnificent ship performed with flying colors. It was a tremendously gratifying experience, and a real tribute to the skills and capabilities of the men and women at Quincy."

At Anchor. *With the Boston skyline in the background,* Virgo *lies at anchor after completing her sea trials framed by the ensign of the ferryboat* Nantascot.